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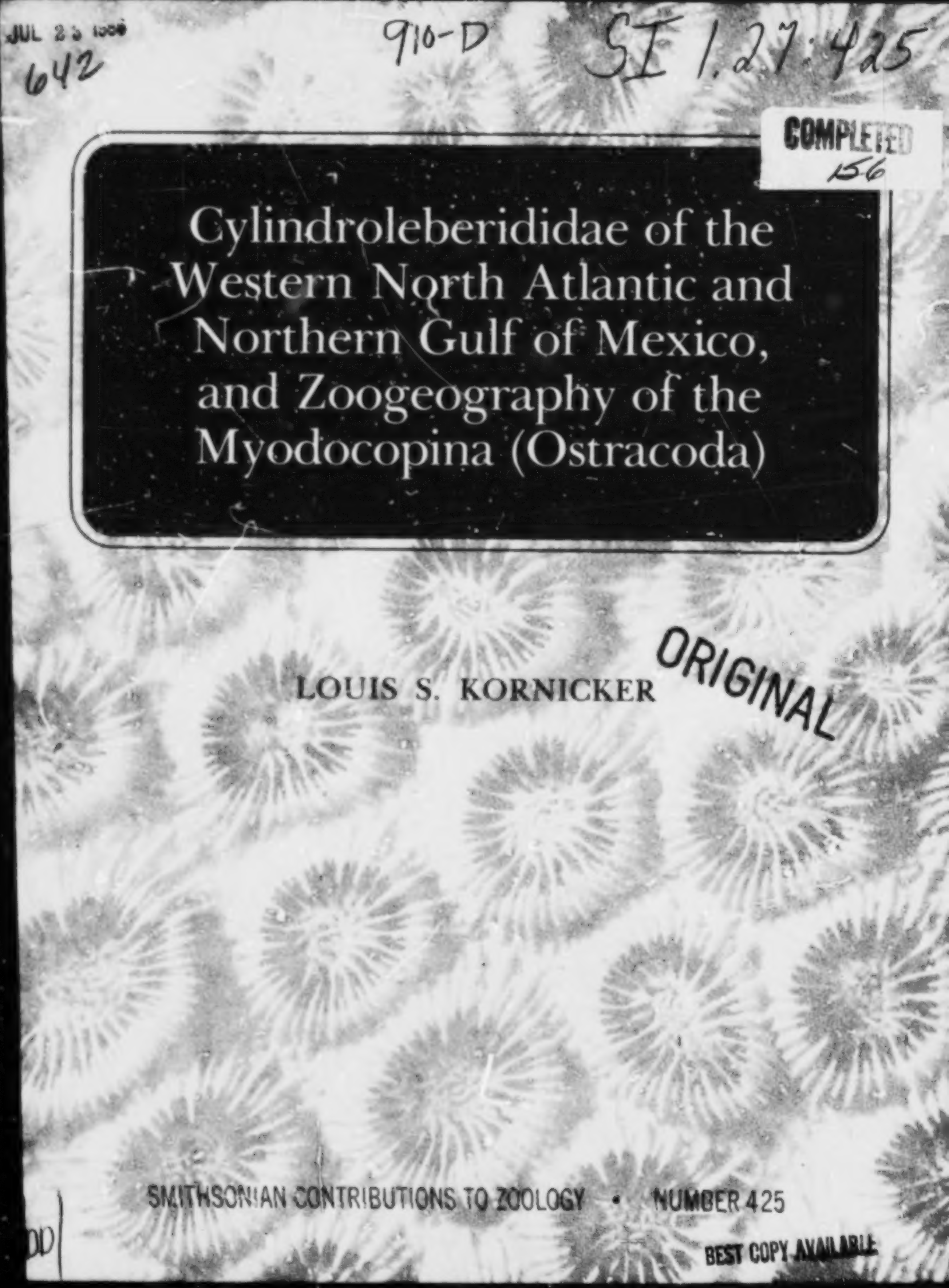

Cylindroleberididae of the Western North Atlantic and Northern Gulf of Mexico, and Zoogeography of the Myodocopina (Ostracoda)

ORIGINAL

LOUIS S. KORNICKER

SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY • NUMBER 425

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SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY • NUMBER 425

Cylindroleberididae of the Western North Atlantic and Northern Gulf of Mexico, and Zoogeography of the Myodocopina (Ostracoda)

Louis S. Kornicker

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ABSTRACT

Kornicker, Louis S. Cylindroleberididae of the Western North Atlantic and Northern Gulf of Mexico, and Zoogeography of the Myodocopina (Ostracoda). *Smithsonian Contributions to Zoology*, number 425, 139 pages, 63 figures, 6 tables, 1986.—Study of the Cylindroleberididae comprising the genera ***Bathyleberis*** with 1 species (new), ***Prionotoleberis*** with 1 species (new), ***Heptonema*** with 2 species (1 new), ***Bruuniella*** with 2 species (1 new), ***Synasterope*** with 8 species (2 new, but 1 left in open nomenclature), ***Diasterope*** with 2 species, ***Parasterope*** with 5 species (1 new),. ***Postasterope*** (new genus) with 3 species (2 new), ***Amboleberis*** with 1 species, ***Actinoseta*** with 3 species, ***Asteropella*** with 7 species (2 new), and ***Asteropterygion*** with 1 species, on the continental shelves of eastern North America and the Northern Gulf of Mexico, the West Indies, Bermuda, and the Caribbean coast of Central America. The new species and some previously known species are described and illustrated. Keys are given for genera and species in the study area. Distribution is discussed, shown on 4 maps, and listed in 2 tables. In addition, the zoogeography of all Myodocopina in the study area is analyzed and related to faunal provinces; a map is presented showing distribution of provinces. Diversity of species is highest in the middle neritic zone (20–100m) and increases from North to South along the Atlantic coast of North America, but is the same in the NE and NW quadrants of the Gulf of Mexico.

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Cylindroleberididae of the Western North Atlantic and Northern Gulf of Mexico, and Zoogeography of the Myodocopina (Ostracoda)

Louis S. Kornicker

Introduction

This work mainly concerns the Cylindroleberididae living on the continental shelves of the western North Atlantic and northern Gulf of Mexico, but also includes collections from the West Indies and Bermuda. Localities south of latitude 24°S and in Bermuda are not included in maps showing distribution of species (Figures 1–4), but are listed in Table 1.

The study includes discussion of species of Cylindroleberididae previously reported from the area, as well as those obtained in new collections. Twelve genera (1 new) and 36 species (11 new, including 1 left in open nomenclature) are considered. Keys are constructed for genera and species.

The present contribution is the last of a series of 5 papers, each concerned with a family of Myodocopina in the western North Atlantic and northern Gulf of Mexico (Kornicker, 1983a, 1984a,b, 1986). A primary objective of these papers is to provide a firmer base for future studies in the area, and therefore they include diagnoses of previously described species, and where necessary, supplementary descriptions and illustrations. A wealth of new material, especially from the northern Gulf of Mexico, become available as the study progressed, but not all new species encountered were described. Those not described are mostly in the Sarsiellinae, Cylindroleberidinae, Philomedinae, and in the genus *Vargula* of the Cypridininae. During the study it became necessary to examine specimens from outside the area in order to understand systematic relationships, and this resulted in additional publications (1978, 1981a,b, 1982, 1983b,c), but information pertinent to recognition of species in the area is also included in the 5 papers.

Two species in the Philomedinae not included in the 5 papers are *Zeugophilomedes multichelatus* Kornicker, 1958, which was discussed in Kornicker, 1983c, and a species of *Euphilomedes* from Cruz Bay, West Indies, incorrectly referred to *Philomedes sordida* Müller, 1890:237, by Brady (1902:186). Brady's species is listed in Table 3 as *Euphilomedes "sordida."*

The zoogeography of Myodocopina in the study area is analyzed and related to faunal provinces (Figure 63).

Poulsen (1962, 1965) chose not to designate type-species for the many new genera that he proposed. The International Code of Zoological

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Louis S. Kornicker, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.

Nomenclature is quite clear and emphatic that a genus-group name published after 1930 must be accompanied by the definite fixation of a type-species (Articles10 and 13b). Therefore, none of Poulsen's new genera, with the exception of monotypic genera, become available until type-species have been selected. An individual designating in print the type-species for a particular genus automatically becomes the author of that genus. Because the author designating the type-species may have a different concept of the genus than that of Poulsen, it is important for understanding the genus to have the author validating the genus designated as the author of the genus. Although this procedure is manifestly unfair to Dr. Poulsen, whose genera were well conceived and clearly described, the systematics of the Myodocopa will clearly be more stable if Article 13b is followed. The generic authorships cited in the present paper as well as in a previous paper (Kornicker, 1986) therefore reflect the application of that article. All new genera proposed by Poulsen in his major 1962 and 1965 publications now have designated type-species and are, therefore, valid.

ABBREVIATIONS.—Specimens with numbers preceded by AHF are in the Allan Hancock Foundation of the University of Southern California, Los Angeles; those preceded by UMMP are in the University of Michigan Museum of Paleontology; those preceded by USNM are in the National Museum of Natural History (NMNH).

DISPOSITION OF SPECIMENS.—Most of the specimens have been deposited at the National Museum of Natural History, Smithsonian Institution and many of these have been assigned USNM numbers. The disposition of other specimens is given in the text in the section where the species is described or in "Station Data with Specimens Examined". In the species presentations, the specimens in the "Material" sections are listed in the same order of locality as the station data.

ACKNOWLEDGMENTS.—Credits are given in "Station Data with Specimens Examined" to the individuals and institutions that have contributed specimens used in this study. The collecting of many specimens was made possible by funds granted to the various institutions by the U.S. Bureau of Land Management. Specimens obtained from Mote Marine Laboratory were collected mostly under Bureau of Land Management Contract No. AA851-CTO-50. I deeply appreciate the opportunity to examine the collections.

I thank the following people for their help: Carolyn Gast for rendering the shaded drawings of the carapaces; Kathryn Schroeder Brown for assisting in preparation and inking of appendage drawings; Elizabeth Harrison for general assistance; I.G. Sohn and T.E. Bowman for reviewing the manuscript; and Jack Korytowski for final editing and preparation of the manuscript for publication.

Station Data with Specimens Examined

(Listed in geographic order from north to south, east to west)

CANADA

Petpsewick Inlet, Nova Scotia; shallow water; collected by Ursula Griggs.

Sta 3, 1973.
Parasterope pollex: 1 ovigerous female (USNM 143751).
Sta 3, 2 Nov 1974.
Parasterope pollex: 4 specimens (USNM 151231).

MAINE

Gulf of Maine, 1983–1984; temperatures and salinity taken at bottom; collected by Les Watling, University of Maine.

Sta B-1, sample A-2; 43°48.91′N, 69°41.93′W; 34 m; 6°C; salinity 31.7 parts per thousand.
Synasterope cushmani: 1 juvenile.
Sta B-1, sample A-3; 43°49.11′N, 69°41.80′W; 30 m; 6°C; salinity 31.7 parts per thousand.
Synasterope cushmani: 1 A-1 male with choniostomatid parasite + 1 juvenile.
Sta B-1, sample A-11; same station data as sample A-3.
Synasterope cushmani: 1 specimen.
Sta B-2, sample A-140; 43°55.2′N, 68°46.41′W; 105 m;

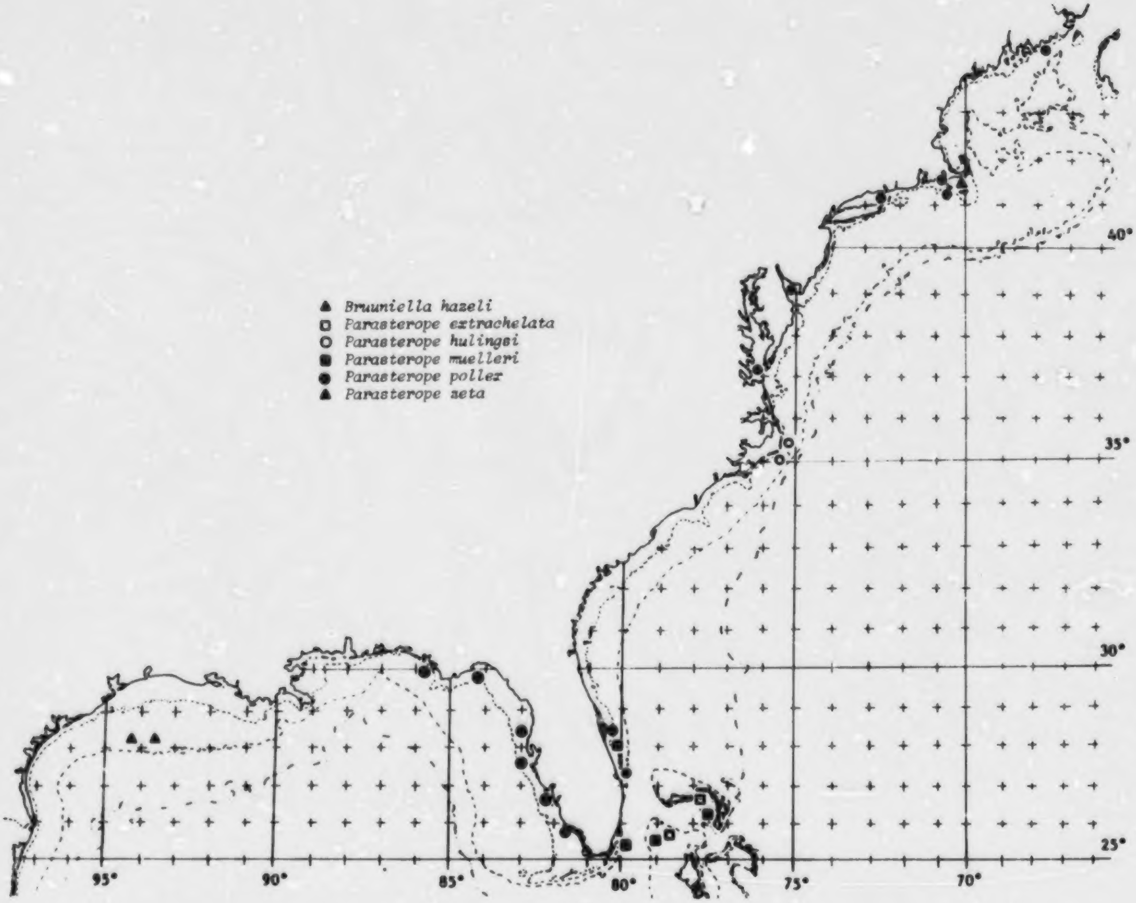
▲ Bruuniella hazeli
◘ Parasterope extrachelata
○ Parasterope hulingsi
■ Parasterope muelleri
● Parasterope pollex
▲ Parasterope zeta
40°
35°
30°
25°
95°
90°
85°
80°
75°
70°

FIGURE 1.—Distribution of Cylindroleberidinae: ***Bruuniella hazeli, Parasterope extrachelata, P. hulingsi, P. muelleri, P. pollex, P. zeta.*** (Some closely spaced stations are represented by a single symbol. Depth contours represent 10, 100, and 1000 fathoms.)

6°C, salinity 31.7 parts per thousand.

Synasterope cushmani: 1 ovigerous female.

Sta B-7, sample A-21; 42°32.6′N, 69°31.8′W; 289 m; 7°C, salinity 33.8 parts per thousand

Heptonema latum: 1 A-1 male with female choniostomatid parasite.

Sta B-9, sample A-173; 43°26.9′N, 67°49.1′W; 292 m; 8.1°C; salinity 33.5 parts per thousand.

Heptonema latum: 1 adult male.

MASSACHUSETTS

Woods Hole, Barnstable County; 9 Jul 1875, surface collection; collected by A.E. Verrill.

Parasterope pollex: 3 adult males and 1 incompletely developed male (USNM 152447).

Martha's Vineyard; 14 Sep 1975; small bottom trawl; collected by Steven C. Kornicker and Louis S. Kornicker.

Sta 2; Vineyard Haven Harbor, southeast side near east end of bridge; depth 0.3–1.0 m (low tide); turtle grass.

Parasterope pollex: 2 ovigerous females, 2 adult females without eggs, 2 adult males, 5 juveniles including 1 with choniostomatid copepod within carapace (USNM 156699).

Sta 3; Chappaquiddick Bridge, west side of north end; depth 0.6 m.

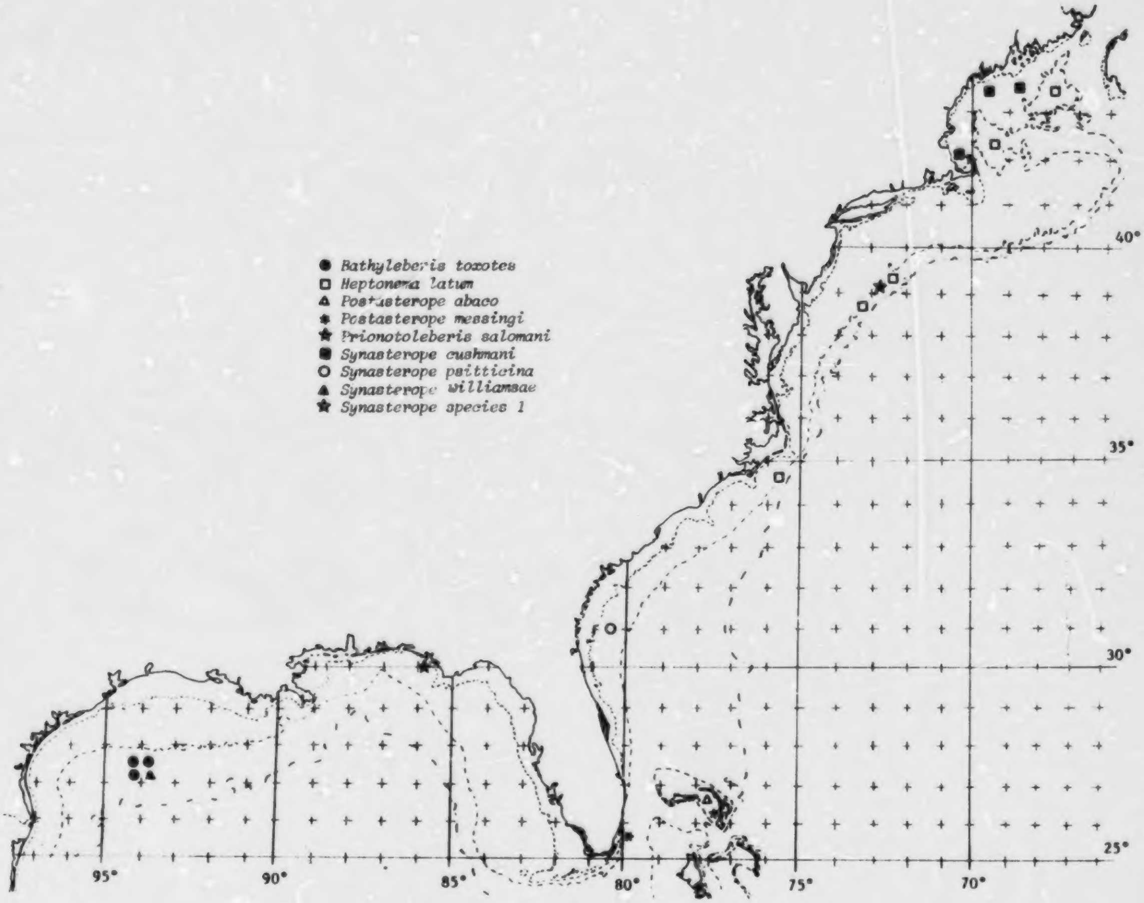
● Bathyleberis toxotes
□ Heptonema latum
△ Postasterope abaco
* Postasterope messingi
★ Prionotoleberis salomani
■ Synasterope cushmani
○ Synasterope psitticina
▲ Synasterope williamsae
★ Synasterope species 1
40°
35°
30°
25°
95°
90°
85°
80°
75°
70°

FIGURE 2.—Distribution of Cylindroleberidinae: *Bathyleberis toxotes, Heptonema latum, Postasterope abaco, P. messingi, Prionotoleberis salomani, Synasterope cushmani, S. psitticina, S. williamsae, Synasterope* species 1. (Some closely spaced stations are represented by a single symbol. Depth contours represent 10, 100, and 1000 fathoms.)

Parasterope pollex: 6 specimens including ovigerous females (USNM 156701).

Martha's Vineyard; Jul 1965; collected by Mrs. C.R. Stoertz.

Sta 1; Stonewall Pond (between Gay Head and Chilmark) separated from ocean side by bar, near ocean side; depth 2 m.

Parasterope pollex: 24 specimens (USNM 152458).

Sta 6; Stonewall Pond, tidal pool near bridge; depth 3 m.

Parasterope pollex: 7 specimens (USNM 152848).

Sta 7; Lagoon Pond; depth 2 m.

Parasterope pollex: 12 specimens (USNM 152452).

Sta 9; Vineyard Haven Harbor; southeast side just off highway bridge, depth 1.5 m.

Bruuniella hazeli: 1 ovigerous female (USNM 152849).

Atlantic coast, probably near Danvers; 18 Jul 1910; low tide; collected by Rev. H.W. Winkly, Danvers, Mass. The label in the vial containing these specimens gives the collecting locality as Davenport, Mass., but no coastal locality named Davenport could be found (pers. comm. Mr. Johnson, Geographic Board of Names).

Parasterope pollex: 4 ovigerous females (USNM 152850).

NEW YORK

Long Island Sound, collected by Marcia Bowen, New York Science Laboratory, Montauk, New York. Specimens returned to collector.

Sta EB 4-1; 1 Apr 1975; near Eaton's Neck; depth 33.5 m.
Parasterope pollex: 1 juvenile female.

Lake Montauk, May 1975; intertidal mud; salinity range 24.6–30.0 parts per thousand in lake, but salinity at time of sample unknown. Collected by, and returned to, Marcia Bowen.

Parasterope pollex: 12 specimens including 1 ovigerous female and 1 adult male.

NEW JERSEY

R/V *Columbus Iselin*; 0.10 square meter Smith MacIntyre grab; collected by Marcia Bowen.

Sta F4; 7 Nov 1975; 38°44′36″N, 73°03′04″W; 183 m.
Heptonema latum: 1 ovigerous female (USNM 157697).
Sta F4; 10 Nov 1975.
Heptonema latum: 1 juvenile male (USNM 157829).
Sta A3; 11 Nov 1975; 39°16′37″N, 72°29′57″W; 136 m.
Heptonema latum: 1 ovigerous female (USNM 157830).
Sta A4; 11 Nov 1975; 39°14′17″N, 72°26′43″W; 196 m.
Heptonema latum: 1 A-2? male (USNM 156942).
Sta A4; 12 Nov 1975.
Synasterope species 1: 1 adult male.
Sta F2; 12 Nov 1975; 38°44′14″N, 73°09′08″W; 110–112 m.
Heptonema latum: 1 ovigerous female (USNM 156943).
Synasterope species 1: 1 adult female.

DELAWARE

Delaware Bay near Hawknest; FS sta XIV, 15-B-59; 2 Jul 1953; collected by William H. Amos, University of Delaware Marine Laboratory, Lewes, Delaware.

Parasterope pollex: 1 ovigerous female with 14 eggs (USNM 157776).

VIRGINIA

Mouth of York River, Gloucester Point, Virginia, from shallows near pier of Virginia Institute of Marine Science, 1962; collected by Dr. Marvin L. Wass.

Parasterope pollex: 1 ovigerous female (USNM 156709); 1 adult male (USNM 156708); 7 ovigerous females, 2 adult females with choniostomatid parasites, 1 adult female without eggs or parasites, 4 adult males, 2 juveniles (returned to the Virginia Institute of Marine Science).

NORTH CAROLINA

Beaufort Shelf Transect; collected by John H. Day. (Bottom temperatures obtained by thrusting thermometer into substrate as soon as it was taken out of van Veen grab.)

Sta 61Q; 6 Apr 1965; 34°19′42″N, 75°52′00″W; 210 m; sandy mud; 10 minute trawl 30 in wide.
Heptonema latum: 1 adult male (USNM 156799).
Sta 96V; 6 Jun 1965; 34°27′N, 76°02′W,41 m; 24.1°C; shelly sand; 15 minute dredge.
Amboleberis americana: 1 specimen.
Sta 133X; 30 Sep 1965; 34°18′30″N, 76°07′00″; 40 m; 25°C; sandy mud; 10 minute dredge.
Amboleberis americana: 1 specimen.
Sta 236S; 30 Nov 1965; 34°24′48″N, 75°59′30″W; 40 m; 20°C; sediment median grain size 0.206 mm; 10 minute dredge.
Amboleberis americana: 3 specimens.

Collected aboard R/V *Easton*, Cruise E-1-78; Jan 1978; received from Donald Weston, Virginia Institute of Marine Science, Glouster Point, Va. These specimens had been partly identified by Donald Weston (in litt., Sep 1980), and were reexamined by me.

Sta 157-1; 35°02′06″N. 75°34′30″W; 31 m.
Parasterope hulingsi: 1 adult female (USNM 158570), 1 ovigerous female (USNM 158601).
Sta 161-1; 35°01′18″N, 75°31′36″W; 36 m.
Amboleberis americana: 1 specimen (returned to sender).
Sta 230-1; 35°31′18″N, 75°13′12″W; 32 m.
Parasterope hulingsi: 1 adult male (USNM 158571).

FLORIDA

Atlantic

Bureau of Land Management southeast coastal study; received from Linda H. Pequegnat, Texas A&M University.

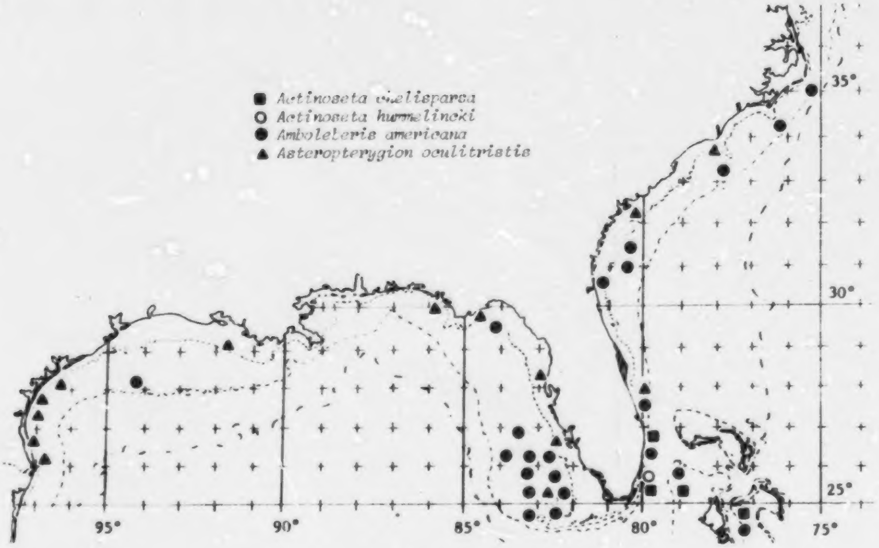
■ Actinoseta chelisparsa
○ Actinoseta hummelincki
● Amboleberis americana
▲ Asteropterygion oculitristis
35°
30°
25°
95°
90°
85°
80°
75°

Figure 3.—Distribution of Cyclasteropinae and Asteropteroninae: *Actinoseta chelisparsa, A. hummelincki, Amboleberis americana, Asteropterygion oculitristis.* (Some closely spaced stations are represented by a single symbol. Depth contours represent 10, 100, and 1000 fathoms.)

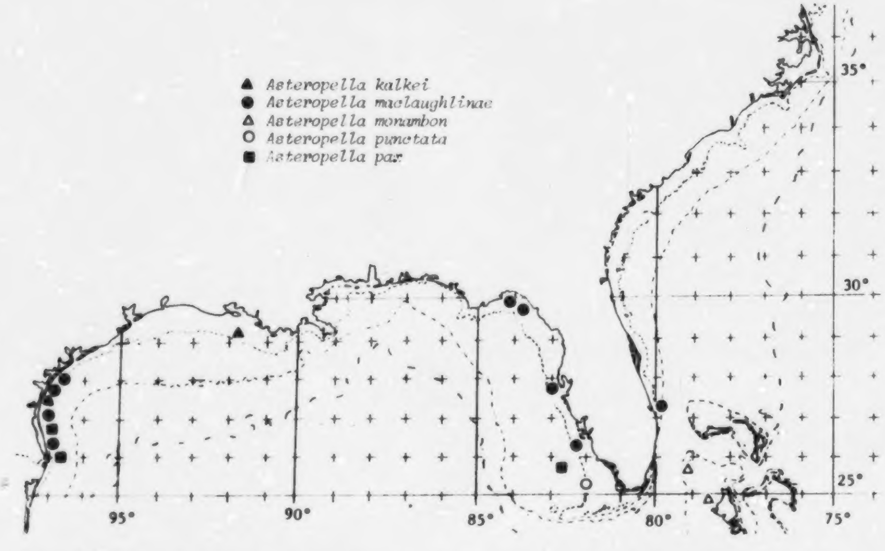
▲ Asteropella kalkei
● Asteropella maclaughlinae
△ Asteropella monambon
○ Asteropella punctata
■ Asteropella pax
35°
30°
25°
95°
90°
85°
80°
75°

Figure 4.—Depth of Asteropteroninae: *Asteropella kalkei, A. maclaughlinae, A. monambon, A. punctata, A. pax.* (Some closely spaced stations are represented by a single symbol. Depth contours represent 10, 100, and 1000 fathoms.)

Sta 265-2(6E); 1 Mar 1977; 30°23′N, 80°26′W; 39 m.
Amboleberis americana: 1 juvenile.

Indian River, St. Lucie and Brevard counties; grab samples collected with post-hole digger; received from William E. Miller, III Harbor Branch Foundation, Inc. (Water depth given in cm or m; temperature given is that of water.)

Sta 144; 10 Nov 1976; Haulover Canal, Brevard County; east side of river on northeast spoil bank's northern shoreline, cove area, 8 m offshore; *Halodule* grassflat; 28°44′06″N, 80°45′24″W; 30 cm; 15.5°C; salinity 34 parts per thousand.
Parasterope pollex: 1 specimen (USNM 158097).

Sta 242; 14 Nov 1978; locality same as sta 144; 32 cm; 17.5°C; salinity 37 parts per thousand.
Parasterope pollex: 13 specimens (USNM 158072) plus 6 specimens returned to Harbor Branch Foundation.

Sta 243B; 16 Nov 1978; St. Lucie Inlet, Martin County; station at post-marker ¼ mile (0.4 km) NW of Seminole Shores' western seawall, transect extends south from post; 27°10′54″N, 80°10′18″W; 25 cm; 19.4°C; salinity 34 parts per thousand.
Asteropella maclaughlinae: 1 specimen (USNM 158098).

Sta 246; 10 Apr 1978; locality same as sta 144; 25 cm; 20°C; salinity 33 parts per thousand.
Parasterope pollex: 1 ovigerous female returned to Harbor Branch Foundation.

Sta 249; 25 Apr 1978; Fort Pierce, Saint Lucie County; east side of river, 200 yards, (180 m) west of Round Island's western boundary, approximately 1 mile (1.6 km) northeast of the Link Port site; sample collected on bare sand control outside of screened cage; 48 cm; 28°C; salinity 36 parts per thousand.
Parasterope pollex: 151 specimens (USNM 158053–158057); 14 specimens (USNM 158061); 139 specimens (USNM 158099); 19 specimens (USNM 158060); 147 specimens (USNM 158077); 26 specimens (USNM 158103).

Sta 250; 25 Apr 1978; locality same as sta 249; sample collected on grass control outside screened cage; 73 cm; 28°C; salinity 36 parts per thousand.
Parasterope pollex: 1 juvenile (USNM 158064).

Sta 252; 22 May 1978; locality same as sta 249; sample collected in outer section of cage on sand; 44 cm; 29.5°C; salinity 35 parts per thousand.
Parasterope pollex: 5 specimens (USNM 158081) plus 7 specimens returned to Harbor Branch Foundation.

Sta 252C; same as sta 252 except water depth only 15 cm.
Parasterope pollex: 2 specimens returned to Harbor Branch Foundation.

Sta 253; 22 May 1978; same locality as sta 249; sample collected in inner section of cage on sand; 44 cm; 29.5°C; salinity 35 parts per thousand.
Parasterope pollex: 1 specimen returned to Harbor Branch Foundation.

Sta 253C; same as sta 253 except water depth only 15 cm.
Parasterope pollex: 20 specimens (USNM 158069) plus 4 specimens returned to Harbor Branch Foundation.

Sta 254C; 22 May 1978; same locality as sta 249; sample collected in outer section of cage on grass; 28 cm; 29.5°C; salinity 35 parts per thousand.
Parasterope pollex: 1 ovigerous female (USNM 158074).

Sta 256; 22 May 1978; same locality as sta 249; sample collected on sand control outside of cage; 48 cm; 29.5°C; salinity 35 parts per thousand.
Parasterope pollex: 192 specimens (USNM 158092); 174 specimens (USNM 158090) plus 2 specimens returned to Harbor Branch Foundation.

Sta 257; 22 May 1978; locality same as sta 249; sample collected on grass control outside screened cage; 30 cm; 29.5°C; salinity 35 parts per thousand.
Parasterope pollex: 1 specimen returned to Harbor Branch Foundation.

Sta 265; 27 Jun 1978; locality same as sta 249; sample collected in inner section of cage on grass; 37 cm; 29.5°C; salinity 32 parts per thousand.
Parasterope pollex: 1 ovigerous female returned to Harbor Branch Foundation.

Sta 266; 17 Jun 1978; locality same as sta 249; sample collected on sand control outside screened cage; 47 cm; 29.5°C; salinity 32 parts per thousand.
Parasterope pollex: 98 specimens (USNM 158076); 136 specimen (USNM 158102); 13 specimens (USNM 158104).

Banana River, Eau Gallie, Brevard County, north of harbor cut, east of marker number 1, between double *Spartina* beds, 10 m off shore; 28°12′00″N, 80°37′00″W; samples collected with post-hole digger; received from John E. Miller III, Harbor Branch Foundation. (Temperature given is that at bottom.)

Sta 121A; 10 Jul 1975; 40 cm; 28°C; salinity 21 parts per thousand.
Parasterope pollex: 1 juvenile male (USNM 156656). Reported by Kornicker (1977:792) as *Parasterope* sp. indet.

Pepper State Park, St Lucie Co, John K. Reed's *Oculina varicosa* coral study; collected by J.K. Reed, F. Stanton, and L. Edmonton, using SCUBA. Specimens received through John E. Miller III, Harbor Branch Foundation.

Ledge Dive 03; 10 Jul 1975; 27°29′36″N, 80°17′00″W; 7–8 m.

Parasterope pollex: 1 ovigerous female + 1 juvenile (USNM 158369).

Ledge Dive 14B, 9 Sep 1976; 27°30′00″N, 80°17′06″W; 6.1 m.

Parasterope muelleri: 22 specimens including ovigerous females (USNM 158370).

Ledge 17A; 25 Jan 1977; 27°29′36″N, 80°17′18″W; 6.1 m.

Parasterope muelleri: 2 specimens (USNM 158371).

Ledge Dive 18A; 28 Apr 1977; 27°29′36″N, 80°17′08″W; 5.5 m

Parasterope muelleri: 1 adult male + 2 juvenile males (USNM 158367).

Ledge Dive 18C; same station data as 18A except water depth 4.9 m.

Parasterope muelleri: 1 adult male (USNM 158372), 1 ovigerous female (USNM 158377).

Ledge Dive 19A; 28 Jun 1977; 27°29′36″N, 80°17′18″W; 5.2 m.

Parasterope muelleri: 5 specimens (USNM 158373).

Ledge Dive 19B; same station data as 19A except depth 5.5 m.

Parasterope muelleri: 3 ovigerous females (USNM 158374) + 28 specimens (USNM 158378).

Ledge Dive 19C; same station data as 19A except depth 5.8 m.

Parasterope muelleri: 27 specimens including ovigerous females (USNM 158366).

Ledge Dive 19D; same station as 19A except depth 6.7 m.

Parasterope muelleri: 4 specimens (USNM 158368).

Ledge Dive 25B; 12 Sep 1977; 27°29′36″N, 80°17′18″W; 6.7 m.

Parasterope muelleri: 1 ovigerous female (USNM 158375).

Ledge Dive 25C; same station data as 25B except depth 6.4 m.

Parasterope muelleri: 11 specimens returned to Harbor Branch Foundation.

Ledge Dive 25D; same station data as 25B except depth 5.8 m.

Parasterope muelleri: 3 specimens (USNM 158376).

Florida Keys; Key Biscayne side of Bear Cut between Key Biscayne and Bear Key; 20 Feb 1976; Ockelman sled drawn 1 mile (1.6 km) through bed of *Thalassia testudinum*; 2–4 m; collected by C.Q. Messing and I. Brook.

Postasterope messingi: 1 ovigerous female (USNM 156715).

Biscayne Key, sta 1, 11 Jul 1965, intertidal to 2 m; collected by D.W. Kirtley.

Parasterope muelleri: 3 ovigerous females and 17 juveniles (USNM 152852); 3 ovigerous females (USNM 152854–152856).

Dry Tortugas; collected by W.L. Schmitt. Reported by Tressler (1949:338).

Sta 30-30; 24 Jul 1930; west side of Loggerhead Key; 4–5 m.

Parasterope muelleri: 1 incomplete specimen (USNM 88856).

Station unknown; 26 Jun 1931; west side of Loggerhead Key; cracked up rock.

Parasterope muelleri: 1 specimen (USNM 88854).

Sta 16-31; 30 Jun 1931; south side of channel through Bird Key reef; from *Porites* clumps collected as low tide.

Parasterope muelleri: 1 ovigerous female (USNM 88853).

FLORIDA

Gulf of Mexico

Bureau of Land Management Southwest Florida Continental Shelf Study; collected by James K. Culter, Mote Marine Laboratory, Sarasota Florida; from soft substrate with Unseld spade corer.

Sta 4; 31 Jan 1982; 26°45′49″N, 83°32′07″W; 55.8 m.

Amboleberis americana: 1 specimen (returned).

Sta 5; 22 Jul 1981; 26°45′42″N, 84°00′08″W; 90.8 m.

Amboleberis americana: 1 specimen (returned).

Sta 5; 31 Jan 1982.

Amboleberis americana: 1 specimen (returned).

Sta 6; 1 May 1981; 26°16′47″N, 82°38′21″W; 26.5 m

Amboleberis americana: 1 specimen (returned).

Sta 6; 28 Jul 1981.

Amboleberis americana: 7 specimens (returned).

Sta 6; 2 Feb 1982.

Amboleberis americana: 1 specimen (returned).

Sta 8; 5 Nov 1980; 26°16′43″N, 83°12′49″W; 48.5 m.

Amboleberis americana: 3 specimens (returned).

Sta 12; 30 Apr 1981; 26°16′43″N, 83°47′40″W; 97.5 m.

Amboleberis americana: 1 specimen (returned).

Sta 14; 8 Nov 1980, 25°46′01″N, 82°23′49″W; 26.0 m.

Amboleberis americana: 4 specimens (returned).

Sta 14; 28 Apr 1981.

Asteropella pax: 1 specimen (USNM 193151).

Sta 14; 27 May 1981.

Amboleberis americana: 4 specimens (returned).

Sta 14; 28 Jul 1981.

Amboleberis americana: 6 specimens (returned).

Sta 14; 12 Feb 1982.
Amboleberis americana: 5 specimens (returned).
Asteropella pax: 1 specimen (USNM 193152).
Sta 16; 9 Nov 1980; 25°45′42″N, 83°11′04″W; 53.0 m.
Amboleberis americana: 1 specimen (returned).
Sta 16; 12 Feb 1982.
Amboleberis americana: 1 specimen (returned).
Actinoseta chelisparsa: 1 specimen (returned).
Sta 20; 18 Nov 1980; 25°17′20″N; 82°09′44″W; 22.5 m.
Actinoseta chelisparsa: 8 specimens (returned).
Asteropella punctata: 1 specimen.
Sta 20; 22 Apr 1981.
Actinoseta chelisparsa: 3 specimens (returned).
Sta 20; 27 May 1981.
Amboleberis americana: 1 specimen (returned).
Actinoseta chelisparsa: 1 specimen (returned).
Asteropella punctata: 1 ovigerous female + 1 juvenile.
Sta 20; 29 Jul 1981.
Amboleberis americana: 4 specimens (returned).
Asteropterygion oculitristis: 2 specimens (returned).
Asteropella punctata: 5 juveniles.
Sta 20; 11 Feb 1982.
Actinoseta chelisparsa: 1 specimen (returned).
Asteropella punctata: 1 ovigerous female + 2 juveniles.
Asteropella maclaughlinae: 1 specimen.
Sta 22; 17 Nov 1980; 25°17′11″N, 83°02′04″W; 52.7 m.
Amboleberis americana: 41 juveniles (returned).
Sta 22; 1 Aug 1981.
Amboleberis americana: 3 specimens (returned).
Sta 28; 20 Nov 1980; 24°47′07″N, 83°13′05″W; 58.5 m.
Amboleberis americana: 1 juvenile (returned) + 1 specimen.
Sta 22; 1 Aug 1981.
Amboleberis americana: 3 specimens (returned).
Sta 28; 20 Nov 1980; 24°47′07″N, 83°13′05″W; 58.5 m.
Amboleberis americana: 1 juvenile (returned) + 1 specimen.
Sta 28; 4 Aug 1981.
Amboleberis americana: 2 specimens (returned).

Southwest Florida Continental Shelf off Pinellas County; collected by James K. Culter, Mote Marine Laboratory, Sarasota, Florida. Samples containing specimens from more than one station collected on 28–30 May 1980 and on 13–17 Oct 1980 at depths ranging from 1.6 m to 13.9 m. Localities of these specimens not shown on maps.

Vial B.
Asteropterygion oculitristis: 1 specimen (returned).
Vial C.
Amboleberis americana: 1 specimen (returned).
Asteropterygion oculitristis: 5 specimens (returned).
Vial D.
Amboleberis americana: 3 specimens (returned).
Asteropterygion oculitristis: 2 specimens (returned).
Vial F.
Asteropella species indeterminate: 1 juvenile.
Vial G.
Asteropella species indeterminate: 1 ovigerous female with shell in poor condition.
Vial J.
Actinoseta chelisparsa: 1 specimen (returned).
Vial L.
Asteropella punctata: 1 adult

Bureau of Land Management Continental Shelf Study in Gulf of Mexico; collections from the Gulf Coast Research Laboratory, Ocean Springs, Mississippi, received from Dr. Richard W. Heard.

Sta 2419; near Apalachee Bay; Sep 1977; 29°46′59.8″N, 84°05′00.2″W; 10 m.
Asteropella maclaughlinae: 1 specimen (USNM 193148).
Amboleberis americana: 1 juvenile (USNM 193149).

Rookery Bay and vicinity; collected by Robert Higgins; Apr 1982; meiobenthic dredge samples representing approximately 4 m^2 sediment surface area and subjected to the bubbling extraction method. Specimens in collections of the NMNH.

Sta 820401.1, 820401.2, 820401.3; Apr 1982; respectively 26°01′42″N, 81°44′00″W, 26°02′06″N, 81°43′06″W, 26°02′42″N, 81°42′36″W; Henderson Creek, east of Rookery Bay (south of Naples); depth 1–2 m; mud and sandy mud with brown detritus.
Parasterope pollex: many specimens at each station.
Sta 820402.1, 820402.3; 2 Apr 1982; respectively 26°01′36″N, 81°44′42″W, 26°02′24″N, 81°45′36″W; Rookery Bay (south of Naples); depth 1–2 m; sandy mud.
Parasterope pollex: many specimens at each station.
Sta 820402.6, 820402.7; 2 Apr 1982; respectively 26°03′12″N, 81°45′24″W, 26°02′42″N, 81°45′24″W; mangrove creek at northeast end of Rookery Bay; depth 1–3 m; mud and sandy mud with brown detritus.
Parasterope pollex: many specimens.
Sta 820403.1, 820403.2, 820403.3, 820403.4; 3 Apr 1982; respectively 25°55′42″N, 81°38′24″W, 25°

56′12″N, 81°38′12″W, 25°56′06″N, 81°38′24″W, 25°56′00″N, 81°38′42″W; bay northeast of Goodland; depth 1–2 m; muddy sand.

Parasterope pollex: many specimens.

Sta 820403.7; 3 Apr 1982; 25°57′18″N, 81°42′00″W; Big Marco River; southwest of state highway 951 bridge; depth 1 m; muddy sand.

Parasterope pollex: many specimens.

Sta 820403.8; 3 Apr 1982; 26°01′06″N, 81°44′18″W; south end of Rookery Bay; depth 1–2 m; sandy mud.

Parasterope pollex: many specimens.

Tampa Bay; 1971; collected by Dr. Robert Virnstein.

Parasterope pollex: 1 ovigerous female (USNM 156711); 1 adult male (USNM 156712); 1 ovigerous female (USNM 156710); 2 ovigerous females and 2 additional specimens returned to Dr. Virnstein.

Tampa Bay, west side of bay, south of Gandy Bridge; May 1974; collected by Carolyn Siles Lewis.

Parasterope pollex: 15 ovigerous females, 2 adult males, 17 specimens (adult females without eggs plus juveniles) (USNM 156765).

Anclote Anchorage, west coast of Florida off Tarpon Springs, N of Tampa; collected by Patsy A. McLaughlin; grab sample, 15 × 15 cm sampler similar to post-hole digger, operated by hand. (Temperatures given are those at bottom.)

Sta 2; 6 Mar 1976; 0.5 m; 27.6°C.

Parasterope pollex: 3 specimens (USNM 157044, 157048).

Sta 2; 2 May 1976; 0.75 m; 26.5°C.

Parasterope pollex: 4 specimens (USNM 157055, 157057, 157595).

Sta 3; 14 Jan 1976; 0.5 m; 18.1°C.

Parasterope pollex: 12 specimens (USNM 157009, 157699).

Sta 3; 6 Mar 1976; 0.75 m; 27.2°C.

Parasterope pollex: 2 specimens (USNM 157043).

Sta 3; 2 May 1976; 1.0 m; 26.6°c.

Parasterope pollex: 1 specimen (USNM 157573).

Sta 11; 2 May 1976; 1.0 m; 24.6°C.

Parasterope pollex: 5 specimens (USNM 157053, 157062).

Sta 12; 4 Jan 1976; 0.5 m; 16.2°C.

Parasterope pollex: 16 specimens (USNM 157000).

Sta 13; 4 Jan 1976; 0.5 m; 16.0°C.

Parasterope pollex: 9 specimens (USNM 156997).

Sta 13; 2 May 1976; 1.0 mm; 25.9°C.

Parasterope pollex: 43 specimens (USNM 157578, 157580–157582).

Sta 14; 6 Apr 1976; 0.75 m; 26.4°c.

Parasterope pollex: 1 specimen (USNM 157031).

Sta 14; 2 May 1976; 1.25 m; 25.7°C.

Parasterope pollex: 3 specimens (USNM 157583–157585).

Sta 16; 6 Jan 1976; 3.0 m; 13.1°C.

Parasterope pollex: 12 specimens (USNM 156988, 156996, 157002, 157003).

Sta 16; 7 Mar 1976; 3.0 m; 27.9°C.

Parasterope pollex: 3 specimens (USNM 157040, 157042).

Sta 16; 3 May 1976; 3.0 m; 24.6°C.

Parasterope pollex: 13 specimens (USNM 157063, 157590, 157592, 157593).

Sta 16; 1 Jul 1976; 1.5 m; 29.5°C.

Parasterope pollex: 5 specimens (USNM 157594).

Sta 17; 14 Jan 1976; 0.25 m; 16.3°C.

Parasterope pollex: 3 specimens (USNM 157001).

Sta 19; 7 Jan 1976; 0.5 m; 18.1°C.

Parasterope pollex: 3 specimens (USNM 157006).

Sta 19; 6 Mar 1976; 1.0 m; 27.7°C.

Parasterope pollex: 11 specimens (USNM 157039, 157046, 157050, 157051).

Sta 19; 2 May 1976; 0.75 m; 26.5°C.

Parasterope pollex: 17 specimens (USNM 157059, 157061, 157596, 157597).

Sta 20; 6 Mar 1976; 1.0 m; 27.7°C.

Parasterope pollex: 2 specimens (USNM 157045, 157047).

Sta 20, 2 May 1976; 1.25 m; 25.8°C.

Parasterope pollex: 8 specimens (USNM 157054, 157056, 157060).

Sta 21; 2 Feb 1976; 1.0 m; 16.8°C.

Parasterope pollex: 1 specimen (USNM 157027).

Sta 21; 6 Mar 1976; 0.75 m; 24.8°C.

Parasterope pollex: 1 specimen (USNM 157041).

Sta 21; 6 Apr 1976; 1.50 m; 25.2°C.

Parasterope pollex: 2 specimens (USNM 157033).

Sta 21; 2 May 1976; 1.5 m; 24.5°C.

Parasterope pollex: 14 specimens (USNM 157598–157602).

Sta 22; 2 May 1976; 2.0 m; 24.7°C.

Parasterope pollex: 1 specimen (USNM 157037).

Sta 25; 8 Jan 1976; 1.0 m; 15.9°C.

Parasterope pollex: 1 specimen (USNM 157004).

Sta 26; 7 Mar 1976; 0.75 m; 28.2°C.

Parasterope pollex: 10 specimens (USNM 157016).

Sta 27; 6 Jan 1976; 0.75 m; 15.7°C.

Parasterope pollex: 3 specimens (USNM 157005, 157026).

Sta 27; 7 Mar 1976; 0.75 m; 27.7°C.

Parasterope pollex: 9 specimens (USNM 157038, 157049, 157052).

Sta 27; 3 May 1976; 0.75 m; 26.5°C.

Parasterope pollex: 2 specimens (USNM 157604).

Sta 28; 9 Jan 1976; 2.0 m; 11.7°C.

Parasterope pollex: 28 specimens (USNM 157025).

Sta 30; 2 Feb 1976; 0.75 m.

Parasterope pollex: 3 specimens (USNM 157028).

Sta 30; 6 Apr 1976; 2.25 m; 24.3°C.

Parasterope pollex: 117 specimen (USNM 157029, 157030, 157032, 157034, 157035).

Sta 31; 3 May 1976; 1.0 m; 24.0°C.

Parasterope pollex: 2 specimens (USNM 157606).

Sta 32; 9 Jan 1976; 0.75 m; 11.9°C.

Parasterope pollex: 4 specimens (USNM 157007, 157008, 157024, 157123).

Sta 38; 3 May 1976; 1.0 m; 24.4°C.

Parasterope pollex: 1 specimen (USNM 157058).

Anclote Anchorage, near Tarpon Springs, N. of Tampa, trawl sample with 1 m opening and small bag with ¼ inch stretch mesh; collected by Patsy A. McLaughlin. (Temperatures given are those at bottom.)

Sta 2; 17 Jan 1976; day; 1.0 m; 12.8°C.

Parasterope pollex: 4 specimens (USNM 157421).

Sta 3; 17 Jan 1976; night; 1.0 m; 8.6°C.

Parasterope pollex: 3 specimens (USNM 157422); 1 ovigerous female (USNM 157423).

Sta 3; 17 Jan 1976; day; 1.0 m; 12.8°C.

Parasterope pollex: 11 specimens (USNM 157010).

Sta 3; 2 May 1976; night; 1.0 m; 27.8°C.

Parasterope pollex: 3 specimens (USNM 157424).

Sta 3; 2 May 1976; day; 1.2 m; 25.7°C.

Parasterope pollex: 1 specimen (USNM 157425).

Sta 5; 16 Mar 1976; night; 2.0 m; 24.3°C.

Parasterope pollex: 22 specimens (USNM 157426).

Sta 5; 14 May 1976; day; 2.5 m; 28.3°C.

Parasterope pollex: 5 specimens (USNM 157428, 157429).

Sta 6; 19 Jan 1976; day; 1.25 m; 9.0°C.

Parasterope pollex: 4 specimens (USNM 157011, 157432).

Sta 6; 19 Jan 1976; night; 1.25 m; 9.2°C.

Parasterope pollex: 10 specimens (USNM 157437, 157440).

Sta 6; 18 Mar 1976; day; 2.5 m; 17.6°C.

Parasterope pollex: 1 specimen (USNM 157441); 1 adult male (USNM 157443).

Sta 8; 19 Jan 1976; day; 2.75 m; 10.0°C.

Parasterope pollex: 1 specimen (USNM 157444).

Sta 13; 16 Jan 1976; day; 1.0 m; 18.4°C.

Parasterope pollex: 13 specimens (USNM 157447, 157450).

Sta 13; 16 Jan 1976; night; 1.0 m; 18.8°C.

Parasterope pollex: 6 specimens (USNM 157445, 157448).

Sta 14; 16 Jan 1976; day; 1:25 mm; 17.8°C.

Parasterope pollex: 2 specimens (USNM 157463, 157465).

Sta 14; 16 Jan 1976; night; 1.25 m; 18.1°C.

Parasterope pollex: 7 specimens (USNM 157451, 157455).

Sta 14; 2 Feb 1976; night; 1.75 m; 16.7°C.

Parasterope pollex: 1 specimen (USNM 157470).

Sta 14; 2 Feb 1976; day; 1.0 m; 16.8°C.

Parasterope pollex: 1 specimen (USNM 157471).

Sta 14; 15 Mar 1976; night; 1.5 m; 26.3°C.

Parasterope pollex: 3 specimens (USNM 157473, 157475).

Sta 14; 15 Mar 1976; day; 1.5 m; 25.1°C.

Parasterope pollex: 2 specimens (USNM 157479).

Sta 14; 13 May 1976; day; 1.6 m; 31.3°C.

Parasterope pollex: 16 specimens (USNM 157497).

Sta 15; 16 Jan 1976; day; 2.0 m; 15.0°C.

Parasterope pollex: 1 specimen (USNM 157498).

Sta 16; 16 Jan 1976; night; 3.0 m; 14.7°C.

Parasterope pollex: 2 specimens (USNM 157499, 157506).

Sta 16; 16 Jan 1976; day; 3.0 m; 14.2°C.

Parasterope pollex: 20 specimens (USNM 157504, 157505).

Sta 19; 18 Mar 1976; day; 0.75 m; 20.7°C.

Parasterope pollex: 7 specimens (USNM 157507–157509).

Sta 19; 18 Mar 1976; night; 0.5 m; 19.8°C.

Parasterope pollex: 2 specimens (USNM 157510).

Sta 20; 15 Jan 1976; day; 0.5 m; 17.1°C.

Parasterope pollex: 11 specimens (USNM 157013).

Sta 20; 15 Jan 1976; night; 0.5 m; 17.8°C.

Parasterope pollex: 22 specimens (USNM 157015, 157512).

Sta 20; 15 Mar 1976; night; 1.25 m; 26.0°C.

Parasterope pollex: 1 specimen (USNM 157022).

Sta 21; 15 Jan 1976; night; 0.75 m; 16.9°C.

Parasterope pollex: 3 specimens (USNM 157515).

Sta 21; 15 Jan 1976; day; 0.75 m; 16.7°C.

Parasterope pollex: 4 specimens (USNM 157012, 157518, 157520, 157521).

Sta 21; 2 Feb 1976; day; 1.0 m; 16.8°C.

Parasterope pollex: 4 specimens (USNM 157527, 157530).

Sta 21; 2 Feb 1976; night; 1.25 m; 15.0°C.

Parasterope pollex: 1 specimen (USNM 157529).

Sta 21; 14 Mar 1976; night; 1.25 m; 26.9°C.

Parasterope pollex: 1 specimen (USNM 157532).

Sta 27; 14 Jan 1976; day; 0.75 m; 16.4°C.

Parasterope pollex: 9 specimens (USNM 157536, 157538, 157540).

Sta 27; 14 Jan 1976; night; 0.75 m; 16.8°C.

Parasterope pollex: 22 specimens (USNM 157522, 157537, 157539).

Sta 27; 15 Mar 1976; day; 0.5 m; 23.°C.

Parasterope pollex: 1 specimen (USNM 157541).

Sta 28; 14 Jan 1976; day; 2.0 m; 16.2°C.

Parasterope pollex: 9 specimens (USNM 157014).

Sta 28; 14 Jan 1976; night; 2.0 m; 15.3°C.
Parasterope pollex: 39 specimens (USNM 157019).
Sta 29; 14 Jan 1976; day; 1.25 m; 16.0°C.
Parasterope pollex: 11 specimens (USNM 157550).
Sta 29; 14 Jan 1976; night; 1.25 m; 15.3°C.
Parasterope pollex: 64 specimens (USNM 157543, 157545, 157546, 157548).
Sta 29; 17 Mar 1976; day; 1.25 m; 19.3°C.
Parasterope pollex: 2 specimens (USNM 157551).
Sta 29; 17 Mar 1976; night; 1.0 m; 18.3°C.
Parasterope pollex: 2 specimens (USNM 157021, 157533).
Sta 30; 18 Jan 1976; day; 0.75 m; 11.2°C.
Parasterope pollex: 7 specimens (USNM 157020, 157554).
Sta 30; 18 Jan 1976; night; 0.75 m; 8.9°C.
Parasterope pollex: 4 specimens (USNM 157023).
Sta 30; 2 Feb 1976; day; 1.0 m; 16.2°C.
Parasterope pollex: 305 specimens (USNM 157557, 157561, 157562).
Sta 30; 2 Feb 1976; night; 1.5 m; 13.8°C.
Parasterope pollex: 13 specimens (USNM 157555, 157556, 157558).
Sta 30; 17 Mar 1976; day; 1.0 m; 19.8°C.
Parasterope pollex: 17 specimens (USNM 157017, 157018).
Sta 30; 17 Mar 1976; night; 0.75 m; 17.1°C.
Parasterope pollex: 3 specimen (USNM 157565).
Sta 31; 18 Jan 1976; night; 1.25 m; 9.0°C.
Parasterope pollex: 4 specimens (USNM 157567).
Sta 32; 18 Jan 1976; day; 1.75 m; 11.2°C.
Parasterope pollex: 2 specimens (USNM 157570).
Sta 32; 18 Mar 1976; day; 1.5 m; 16.9°C.
Parasterope pollex: 1 ovigerous female (USNM 157571).
Sta 32; 18 Mar 1976; night; 1.5 m; 18.8°C.
Parasterope pollex: 1 specimen (USNM 157572).

Placida Harbor (near Charlotte Harbor); collected by R.F. Cressey and C.A. Child.

Sample 1; 11 Oct 1970; off Bird Key, west of swinging bridge to Gasparilla Island; 1-2 m; Ockelman dredge.
Parasterope pollex: 3 adult males, 1 ovigerous female, 19 specimens (USNM 156773).
Sample 2; July 1971; off Bird Key; 1–3; Ockelman dredge.
Parasterope pollex: 133 specimens, mostly ovigerous females (USNM 152315); 1 A-1 male (USNM 152318); 1 ovigerous female (USNM 144077); 1 adult male (USNM 144008).
Sample 3; 1 May 1974; off Bird Key; 2–3 m; Ockelman dredge tied to Otter trawl; mud washings.
Parasterope pollex: 1 adult female and 1 juvenile (USNM 152316).
Sample 4; 2 May 1974; off Bird Key; 2–3 m; mud bottom; weed washings from Otter trawl.
Parasterope pollex: 1 juvenile (USNM 152317).
Sample 5; 16 Jul 1974; off Bird Key; 1–2 m; mud washings from Ockelman dredge tied to Otter trawl.
Parasterope pollex: 1 juvenile (USNM 152319).
Sample 6; 9 May 1975; east of Bird Key; weed washings from Otter trawl.
Parasterope pollex: 1 adult male (USNM 153936).
Sample 8; 19 Jun 1975; off Sandfly Key; weed washings from Otter trawl.
Parasterope pollex: 3 juveniles (USNM 153935).

Alligator Harbor (near Lighthouse Point and Apalachee Bay), Franklyn County; exact date of collecting unknown, about 1957; precise depth and locality unknown; collected by Darrell K. Jones

Sta I, 2-2.
Parasterope pollex: 1 specimen (USNM 152512).
Sta II, 3-2.
Parasterope pollex: 1 ovigerous female (USNM 152513).
Sta II, 4-2.
Parasterope pollex: 1 specimen (USNM 152514).
Sta III, 3-1.
Parasterope pollex: 1 ovigerous female (USNM 152515).
Sta III, 3-2.
Parasterope pollex: 1 specimen (USNM 152516).
Sta III, 4-1.
Parasterope pollex: 1 specimen (USNM 152517).
Sta III, 5-1.
Parasterope pollex: 2 ovigerous females (USNM 152518).
Sta IV, 2-1.
Parasterope pollex: 1 specimen (USNM 152519).
Sta IV, 3-1.
Parasterope pollex: 1 specimen (USNM 152520).
Sta IV, 3-2.
Parasterope pollex: 1 adult male (USNM 152521).

Panama City, about 2 mi (3.2 km) W of West Pass, which is entrance into St. Andrew Bay; plug sampler operated by hand, sampler dimensions 12.5 × 12.5 × 23 cm (height); sediment washed through sieve with mesh of 0.701 mm^2; collected by Carl H. Saloman, Southeast Fisheries Center, National Fisheries Services, Panama City, Florida.

Sta 4; 18 Aug 1976; borrow pit; about 610 m offshore; depth 12.8 m; sand substrate.
Parasterope pollex: 1 ovigerous female (USNM 157612).
Sta 4; 1 Sep 1976.
Parasterope pollex: 3 specimens (USNM 157613).
Sta 4; 21 Sep 1976.
Parasterope pollex: 9 females (USNM 157611).

Prionotoleberis salomani: 1 adult male (USNM 157696).

Sta 4; 4 Oct 1976.

Parasterope pollex: 2 ovigerous females, 2 adult males, 1 juvenile (USNM 156781).

Sta 4; 18 Oct 1976.

Parasterope pollex: 1 ovigerous female (USNM 157692).

Sta 30, 17 Jun 1976, about 610 m offshore and adjacent to sta 4; depth 9.1 m; sand substrate.

Parasterope pollex: 1 specimen (USNM 157677).

Sta 30, 10 Aug 1976.

Parasterope pollex: 1 ovigerous female (USNM 157621).

Prionotolebris salomani: 1 adult female (USNM 157840).

Sta 30, 4 Oct 1976.

Parasterope pollex: 1 ovigerous female (USNM 157665).

Sta 30, 1 Dec 1976.

Parasterope pollex: 1 ovigerous female (returned to C.H. Saloman);

Sta 30, 1 Mar 1977.

Parasterope pollex: 1 adult male (USNM 157674).

LOUISIANA

Dames and Moore FEA Brine Disposal Study, Project No. 9929-095/099-27. Received from Richard D. Kalke, The University of Texas Institute of Marine Science.

Sta W2A; 19 Mar 1978; 29°03′34″N, 91°43′22″W; 7 m.

Asteropella kalkei: 1 specimen (USNM 193134).

Sta W5A; 5 Feb 1978; 29°04′36″N, 91°44′36″W; 6.4 m.

Asteropella kalkei: 2 specimens (USNM 193141).

Sta W6A; 5 Feb 1978; 29°04′49″N, 91°44′28″W; 6.1 m.

Asteropella kalkei: 10 specimens (USNM 193130).

Sta W6B; 21 Apr 1978.

Asteropella kalkei: 2 specimens (USNM 193129).

Sta W7A; 19 Mar 1978; 29°04′54″N, 91°44′18″W; 5.5 m.

Asteropella kalkei: 4 specimens (USNM 193124).

Sta W7A; 31 Mar 1978.

Asteropella kalkei: 4 specimens (USNM 193140).

Sta W7B; 21 Apr 1978.

Asteropella kalkei: 9 specimens (USNM 193143).

Sta W8A; 19 Mar 1978; 29°05′35″N, 91°45′48″W; 6.4 m.

Asteropella kalkei: 4 specimens (USNM 193142).

Sta W8A; 31 Mar 1978.

Asteropella kalkei: 1 specimen (USNM 193127).

Sta W8B; 22 Apr 1978.

Asteropella kalkei: 1 specimen (USNM 193125).

Sta W11A; 31 Mar 1978; 29°04′49″N, 91°45′03″W; 6.1 m.

Asteropella kalkei: 2 specimens (USNM 193128).

Sta W11B; 22 Apr 1978.

Asteropterygion oculitristis: 1 specimen.

Sta W12A; 19 Mar 1978; 29°04;42″N, 91°44′48″W; 6.1 m.

Asteropella kalkei: 1 specimen (USNM 193137).

Sta W12A; 33 Mar 1978.

Asteropterygion oculitristis: 1 specimen.

Sta W13A; 5 Feb 1978; 29°04′22″N, 91°44′24″W; 6.4 m.

Asteropella kalkei: 1 specimen (USNM 193131).

Sta W13A; 31 Mar 1978.

Asteropella kalkei: 2 specimens (USNM 193138).

Sta W13B; 22 Apr 1978.

Asteropella kalkei: 3 specimens (USNM 197139), 1 ovigerous female (USNM 159086), 1 specimen (USNM 193119), 1 ovigerous female (159083, holotype).

Sta W14A; 31 Mar 1978; 29°04′14″N, 91°44′16″W; 6.4 m.

Asteropella kalkei: 2 specimens (USNM 193136).

Sta W15A, 5 Feb 1978; 29°05′41″N, 91°48′30″W; 4.9 m.

Asteropella kalkei: 1 adult male (USNM 193121), 1 adult male (USNM 193122), 13 specimens (USNM 193123).

Sta W15A; 19 Mar 1978.

Asteropella kalkei: 5 specimens (USNM 193133).

Sta W15A; 31 Mar 1978.

Asteropella kalkei: 8 specimens (USNM 193132).

Sta W15B; 21 Apr 1978.

Asteropella kalkei: 10 specimens (USNM 193120).

Sta WR4A; 31 Mar 1978; 29°07′26″N, 91°41′30″W; 4 m.

Asteropella kalkei: 2 specimens (USNM 193135).

TEXAS

Gulf of Mexico, off Galveston; R/V *Gyre* (Texas A&M University); 1974; collected by David Gettleson.

Cruise 10.

Sta 16; 28°10′N, 94°18′W; 53.5 m.

Bathyleberis toxotes: 1 juvenile male (USNM 158498).

Amboleberis americana: 1 specimen (USNM 157763) (reported in Kornicker, 1981a:11).

Cruise 11.

Sta 2; 28°22′36″N, 94°01′30″W; 49.75 m.

Bathyleberis toxotes: 1 juvenile male (USNM 158497).

Sta 8; 28°15′18″N, 94°03′00″W; 57.75 m.

Bathyleberis toxotes: 1 adult female (USNM 158232); 1 adult female and 1 juvenile male (USNM 158233A, 158233B).

Parasterope zeta: 1 adult female (USNM 158238), 2 juvenile males (USNM 158236, 158361); 7 juvenile males (USNM 158362).

Sta 9; 28°21′06″N, 93°40′18″W; 57.5 m.
Parasterope zeta: 1 adult male (USNM 158237).
Sta 11; 28°22′12″N, 93°49′30″W; 54.75 m.
Synasterope williamsae: 1 ovigerous female (USNM 158234).
Sta 12; 28°23′30″N, 93°53′30″W; 51.75 m.
Bathyleberis toxotes: 1 juvenile male (USNM 158496).

Bureau of Land Management South Texas Outer Continental Shelf Study; The University of Texas Marine Science Institute's benthic ecology group; collected aboard R/V *Longhorn* by University of Texas Science Institute personnel. Received from Richard D. Kalke.

Transect III, off middle part of Padre Island.
Sta 4; 26 Jun 1976; 26°58′N, 97°20′W; 15 m.
Asteropterygion oculitristis: 3 specimens.
Asteropella maclaughlinae: 1 juvenile.
Sta 4; 22 Sep 1976.
Asteropella maclaughlinae: 1 juvenile.
Asteropella pax: 1 specimen (USNM 193144), 1 A-1 male (USNM 159088).
Sta 4; 1 Feb 1977.
Actinoseta oculitristis: 1 juvenile.
Sta 4; 28 Sep 1977.
Asteropterygion oculitristis: 2 juveniles.
Asteropella maclaughlinae: 3 juveniles.
Asteropella pax: 1 specimen (USNM 193145).
Transect IV, off Port Isabel.
Sta 1; 19 Sep 1976; 28°12′N, 96°27′W; 18 m.
Asteropella maclaughlinae: 1 juvenile.
Sta 4; 26 Jun 1976; 26°10′N, 97°08′W; 15 m.
Asteropterygion oculitristis: 1 adult + 12 juveniles.
Asteropella maclaughlinae: 2 juveniles.
Asteropella pax: 1 juvenile (USNM 193146).
Sta 4; 20 Sep 1976.
Asteropterygion oculitristis: 3 specimens.
Asteropella maclaughlinae: 1 adult male (USNM 193150) + 1 specimen.
Sta 4; 30 Jan 1977.
Asteropterygion oculitristis: 8 specimens.
Asteropella pax: 1 adult male (USNM 159087) + 1 specimen (USNM 193147).
Sta 4; 25 May 1977.
Asteropterygion oculitristis: 2 ovigerous females + 7 first instars.
Sta 4; 28 Sep 1977.
Asteropterygion oculitristis: 1 ovigerous female + 1 specimen.
Asteropella maclaughlinae: 2 specimens.

Benthic infaunal survey of the Corpus Christi ship channel near Ingleside; received from Richard D. Kalke.

Sta SR4B; 16 Sep 1979; 27°49′N, 97°11′W; 1.8 m.
Asteropella maclaughlinae: 1 juvenile.
Sta SR6A; 18 Dec 1979; 27°49′N, 97°12′W; 3.0 m.
Asteropterygion oculitristis: 1 adult.

Marine benthic ecology field trip; offshore of Port Aransas; 18 Jul 1979; 27°29′30″N, 97°05′00″W; 8 m; collected by A.D. McIntyre; received from Richard D. Kalke.

Asteropella kalkei: 50 specimens (USNM 193126).
Asteropterygion oculitristis: 1 ovigerous female + 3 early instars.

BAHAMAS

Andros Island, Rat Cay marine blue hole; 1981–1982; species collected in blow plankton samples. Received from and returned to Dr. George F. Warner. Reported in Warner and Moore (1984:32).

Amboleberis americana: 9 juveniles.
Actinoseta chelisparsa: 1 juvenile.
Asteropella monambon: 1 ovigerous female.

San Salvador Island; dump reef; 22 Dec 1979; about 4 m; small net drawn along bottom in *Thalassia* bed; collected by Anne C. Cohen.

Parasterope muelleri: 2 specimens (USNM 158403).
Synasterope setisparsa: 1 adult female (USNM 158336); 2 juvenile females (USNM 158384A,B); 1 juvenile (USNM 158384C); 5 juveniles (USNM 158402).
Asteropella monambon: 1 juvenile female (USNM 158401A), 1 adult female (USNM 158401B), 15 juveniles + 2 incomplete juveniles (USNM 158401C).

Abaco Island; 24 Mar 1886; USS *Albatross*.

Parasterope muelleri: 1 adult male (USNM 158392); 13 adult males (USNM 158393); 31 adult males (USNM 158603).
Parasterope extrachelata: 4 adult males (USNM 158385, 158391).
Postasterope abaco: 2 adult males (USNM 158387, 158388); 8 adult males (USNM 158602).
Postasterope messingi: 4 adult males (USNM 157894, 158386, 158389, 158390).

Bimini Islands; 1957; 1–5 m; collected by Louis S. Kornicker.

Synasterope setisparsa: 1 ovigerous female (USNM 122901: paratype, specimen 127G in Kornicker, 1958:241).

St. Croix, U.S. Virgin Islands

Buck Island; 1 to 2½ hours after sunset; winter 1980–1981; 2 m depth to bottom; plankton net towed over area of dead *Acropora cervicornis* overgrown by alga and gorgonians; collected by Eldredge Bermingham.

Parasterope muelleri: 8 adult males (USNM 157961a,b).
Amboleberis americana: 1 juvenile (USNM 157959).

Tague Bay, from fore reef or outer face of barrier reef enclosing bay; collected by pushing a 78 cm^2, 0.333 mm mesh net throughout the water column for 10 minutes (sampling about 102 m^3 of water) over sand/cobble substratum adjacent to the reef face, bottom depths 7–10 m; collected by James R. Chess.

Ser. 10; 3 Jun 1981; 2005 hours.
  Amboleberis americana: 3 adult males + 5 juveniles (USNM 158879).
  Parasterope muelleri: 2 adult males + 1 juvenile.
  Asteropella mortenseni: 8 specimens (USNM 157880).
Ser. 15; 8 Jun 1981; 2005 hours.
  Amboleberis americana: 1 adult male (USNM 158882).
Outer reef; 8 Jun 1981; 0053 hours, bottom at 9 m.
  Amboleberis americana: 4 juveniles (USNM 158884).
  Asteropella mortenseni: 4 specimens (USNM 158885).
Vial A; 31 May 1982; benthic airlift.
  Actinoseta chelisparsa: 1 juvenile.
Vial B; Jun 1982; from water column during night.
  Amboleberis americana: many specimens.
  Asteropella mortenseni: 11 specimens.
Vial C; 1 Jun 1982; bottom tow; 0255 hours; depth 8–9 m.
  Amboleberis americana: 6 specimens.
  Asteropella mortenseni: 1 specimen.
Vial D; 1 Jun 1982, midwater sample (3 m); 0255 hours.
  Amboleberis americana: 1 adult male, 2 juveniles.

Distribution

The Cylindroleberidinae is represented in the study area by 8 genera and 24 species (Table 1, Figures 1, 2). *Parasterope pollex* lives in bays and estuaries along the eastern coast of North America from the Halifax area of Canada to near the tip of Florida, and in bays and estuaries along the gulf coast of Florida. The maximum depth at which *P. pollex* was captured is 33.5 m, in Long Island Sound. The species was not collected in a comprehensive study of myodocopids in Cape Cod Bay where it appears to be replaced by *Synasterope cushmani* (Kornicker, 1947b:11), a species also encountered off Maine. *Parasterope muelleri*, which probably comprises a species complex, was collected in the Miami area of Florida, the Dry Tortugas, and in the Bahamas. The species has been reported previously in the Virgin Islands (Poulsen, 1965:370) and Bermuda (Kornicker, 1981b:8), and also in the Mediterranean Sea (Kornicker, 1974b:36) and eastern Atlantic (Kornicker and Caraion, 1974:8). *Heptonema latum* was collected along the edge of the continental shelf off Maine, New Jersey, and North Carolina. It had been reported previously from New Jersey and North Carolina by Bowen et al. (1979, fig. 3). The same authors (1979, fig. 3) also reported, from the same general area, *Synasterope* species 1, a species retained in open nomenclature herein. *Postasterope messingi* was collected in the Bahamas and off the southern tip of Florida. *Bathyleberis toxotes, Parasterope zeta*, and *Synasterope williamsae* were collected on the continental shelf off Texas at depths of about 50–58 m. *Bruuniella hazeli* was collected only in Martha's Vineyard, Massachusetts, and a second species, *Bruuniella* species 1, was previously collected in Bermuda. *Parasterope hulingsi* was collected off North Carolina and Georgia, and had previously been reported off Southern California by Baker (1978:145). *Prionotoleberis salomani* was collected in shallow waters of the gulf of Mexico, off Florida. *Synasterope setisparsa, Parasterope extrachelata*, and *Postasterope abaco* were collected only in the Bahamas. *Heptonema serratum, Synasterope serrata, S. longiseta, S. implumis, Diasterope canina*, and *D. tenuiseta* are known only from the Virgin Islands.

The Cyclasteropinae is represented in the study area by *Amboleberis americana*. The known range of that species is North Carolina to Brazil (Table 2, Figure 3). It occurs in the West Indies, in the Gulf of Mexico, and in the vicinity of coral reefs off Belize. It has been reported also in the eastern Pacific, in the Gulf of Panama and off Costa Rica (Kornicker, 1981a:16).

The Asteropteroninae is represented in the study area by 3 genera containing 10 species

TABLE 1.—Distribution and known depth range (m) of the Cylindroleberidinae on continental shelves of northwestern Atlantic and Gulf of Mexico (dash = not collected; ? = collected but depth unknown).

Locality	*Heptonema*		*Bruuniella*		*Synasterope*							
	serratum	*latum*	*hazeli*	species A	*serrata*	*longiseta*	*implumis*	*cushmani*	*species 1*	*setisparsa*	*psitticina*	*williamsae*
ATLANTIC												
Canada	–	–	–	–	–	–	–	–	–	–	–	–
Massachusetts	–	–	1.5	–	–	–	–	11–36	–	–	–	–
New York	–	–	–	–	–	–	–	–	–	–	–	–
New Jersey	–	110–196	–	–	–	–	–	–	110–196	–	–	–
Delaware	–	–	–	–	–	–	–	–	–	–	–	–
Virginia	–	–	–	–	–	–	–	–	–	–	–	–
North Carolina	–	210	–	–	–	–	–	–	–	–	–	–
Georgia	–	–	–	–	–	–	–	–	–	–	?	–
Florida	–	–	–	–	–	–	–	–	–	–	–	–
GULF OF MEXICO												
Dry Tortugas	–	–	–	–	–	–	–	–	–	–	–	–
Florida	–	–	–	–	–	–	–	–	–	–	–	–
Texas	–	–	–	–	–	–	–	–	–	–	–	55
WEST INDIES												
Bahama Islands	–	–	–	–	–	–	–	–	–	1–5	–	–
Virgin Islands	25–30	–	–	–	50	–	shallow	–	–	–	–	–
BERMUDA	–	–	–	<1	–	–	–	–	–	–	–	–

(Table 2, Figures 3, 4). *Asteropterygion oculitristis* lives on the Atlantic shelf off South Carolina, Georgia, and Florida, and in the Gulf of Mexico. It has been reported also in the eastern Pacific, in the Bahia de los Angeles and off Panama (Kornicker, 1981a:16). *Actinoseta chelisparsa* has a known range from Florida to Venezuela. It occurs in the West Indies, the Gulf of Mexico, and off the coasts of Belize and Panama. *Actinoseta hummelincki* lives in the Atlantic off the coasts of Florida, Belize and Panama. It has been reported also from the Pacific off Panama, but the specific identity is questionble (Kornicker, 1981a:16). Seven species of *Asteropella* live in the study area: *A. agassizii* lives off Panama and Brazil; *A. kalkei* and *Asteropella pax* were collected only in the Gulf of Mexico; *A. punctata* was collected in the Gulf of Mexico (Florida), off Cuba, and in the Virgin Islands; *A. mortenseni* was collected only in the Virgin Islands; *A. monambon* was collected in the West Indies (Bahamas, Cuba, Puerto Rico) and off Belize; and *A. maclaughlinae* was collected on the Atlantic side of Florida, in the Gulf of Mexico, and off Belize.

CYLINDROLEBERIDIDAE Müller, 1906

The family Cylindrolebrididae comprises 3 subfamilies: Cylindroleberidinae Müller, 1906; Cyclasteropinae Poulsen, 1965; and Asteropteroninae Kornicker, 1981a. All subfamilies are represented in the study area.

DISTRIBUTION.—The Cylindroleberidinae ranges from the Arctic to Antarctic and from

TABLE 1.—Continued.

Locality	*Diasterope*		*Parasterope*					*Postasterope*				
	canina	*tenuiseta*	*muelleri*	*zeta*	*hulingsi*	*extrachelata*	*pollex*	*corrugata*	*abaco*	*messingi*	*Bathyleberis toxotes*	*Priomotoleberis salomani*
ATLANTIC												
Canada	–	–	–	–	–	–	shallow	–	–	–	–	–
Massachusetts	–	–	–	–	–	–	1–7	–	–	–	–	–
New York	–	–	–	–	–	–	<1–33.5	–	–	–	–	–
New Jersey	–	–	–	–	–	–	–	–	–	–	–	–
Delaware	–	–	–	–	–	–	?	–	–	–	–	–
Virginia	–	–	–	–	–	–	shallow	–	–	–	–	–
North Carolina	–	–	–	–	31–32	–	–	–	–	–	–	–
Georgia	–	–	–	–	?	–	–	–	–	–	–	–
Florida	–	–	2–6.7	–	–	–	<1–8	–	–	2–4	–	–
GULF OF MEXICO												
Dry Tortugas	–	–	<1–5	–	–	–	–	–	–	–	–	–
Florida	–	–	–	–	–	–	<1–12.8	–	–	–	–	9–13
Texas	–	–	–	58	–	–	–	–	–	–	50–58	–
WEST INDIES												
Bahama Islands	–	–	4	–	–	shallow	–	–	?	?	–	–
Virgin Islands	7	30	2–30	–	–	–	–	10–20	–	–	–	–
BERMUDA	–	–	shallow	–	–	–	–	–	–	–	–	–

intertidal to abyssal depths. The Cyclasteropinae and Asteropteroninae are absent in the Arctic and Antarctic and are generally restricted to shelf depths. An exception is *Pteromeniscus intesi* Kornicker, 1981a, which is found off Mauritania at bathyal depths.

Key to the Subfamilies of Cylindroleberididae

(From Kornicker, 1981a:71)

1. Surface of carapace smooth without ornamentation; 1st antenna with 1 dorsal bristle on 2nd joint; end joint of maxilla with 1 (rarely 2) bristles . . . . CYLINDROLEBERIDINAE
   Surface of carapace smooth or ornamented; 1st antenna with 2 or more dorsal bristles on 2nd joint; end joint of maxilla with 3–7 bristles . . 2
2. Carapace with slit-like incisur; surface smooth except for minute fossae; central adductor muscle scars elongate . . . . CYCLASTEROPINAE
   Carapace with small incisur forming right or acute angle; surface smooth (*Actinoseta chelisparsa, A. jonesi*) or with ridges or nodes (remaining species); central adductor muscle scars ovoid . . ASTEROPTERONINAE

TABLE 2.—Distribution and known depth range (m) of the Cyclasteropinae and Asteropteroninae on continental shelves of western Atlantic, Gulf of Mexico, and Caribbean Sea (dash = not collected; ? = collected but depth unknown).

Locality	*Amboleberis americana*	*Actinoseta*			*Asteropella*							*Asteropterygion oculitristis*
		chelisparsa	*hummelincki*	*jonesi*	*monambon*	*mortenseni*	*punctata*	*maclaughlinae*	*kalkei*	*pax*	*agassizi*	
ATLANTIC												
North Carolina	36–41	–	–	–	–	–	–	–	–	–	–	–
South Carolina	28	–	–	–	–	–	–	–	–	–	–	14–28
Georgia	plankton 16–36.6	–	–	–	–	–	–	–	–	–	–	18
Florida	10–39	2–28	<1–2	–	–	–	–	<1	–	–	–	<1–2
GULF OF MEXICO												
Dry Tortugas	<1–20	–	–	–	–	–	–	–	–	–	–	–
Florida	1.5–97.5	22.5	–	–	–	–	22.5	<1–22.5	–	26	–	1–22.5
Louisiana	–	–	–	–	–	–	–	–	5.5–7	–	–	6.1
Texas	53.5	15	–	–	–	–	–	1.8–18	8	15–18	–	1.8–15
WEST INDIES												
Bahama Islands	3–10	<1–15	–	–	3–20	–	–	–	–	–	–	–
Cuba	–	–	–	–	4	–	6	–	–	–	–	–
Puerto Rico	–	–	–	–	1–1.5	–	–	–	–	–	–	–
Virgin Islands	3–10	7–10	–	–	–	7–40	25–30	–	–	–	–	–
Bonaire	–	3–8	–	–	–	–	–	–	–	–	–	–
Curaçao	–	1.5–3.5	–	–	–	–	–	–	–	–	–	–
BELIZE	4.6	<1–34	<1–6	–	1.5–24	–	–	1	–	–	–	–
PANAMA	–	<1	–	–	–	–	–	–	–	–	<1	–
VENEZUELA	–	<1.5	<1	<1.5	–	–	–	–	–	–	–	–
BRAZIL	?	–	–	–	–	–	–	–	–	–	?	–

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CYLINDROLEBERIDINAE Müller, 1906

The Cylindroleberidinae comprises 15 genera of which 8 have representatives in the study area: *Bruuniella* Poulsen, 1965; *Heptonema* Cohen and Kornicker, 1975; *Diasterope* Kornicker, 1975; *Parasterope* Kornicker, 1975; *Synasterope* Kornicker, 1975; *Prionotoleberis* Kornicker, 1974b; *Bathyleberis* Kornicker, 1975; *Postasterope*, new genus. Only these 8 genera are included in the Key, which is for species in the study area.

Key to Selected Genera of Cylindroleberidinae

1. 2nd and 3rd joints of mandibular endopodite fused .... ***Bruuniella***

2nd and 3rd joints of mandibular endopodite separated by suture 2

2. d-bristle of 1st antenna well developed, about ½ length of e-bristle, with pointed tip (bristle-like) .... ***Bathyleberis***

d-bristle bare, minute or absent 3

3. 2nd endopodial joint of mandible without long lateral bristle between b- and c-bristles of dorsal margin 4

2nd endopodial joint of mandible with long lateral bristle between b- and c-bristles of dorsal margin 5

4. Sensory bristle of 1st antenna of adult female with short proximal filament .... ***Prionotoleberis***

Sensory bristle of 1st antenna of adult female without short proximal filament .... ***Synasterope***

5. Sensory bristle of 1st antenna of adult females with 7 long terminal filaments .... ***Heptonema***

Sensory bristle of 1st antenna of adult females with 6 terminal filaments 6

6. Sensory bristle of 1st antenna of adult female with short proximal filament .... ***Diasterope***

Sensory bristle of 1st antenna of adult female without short proximal filament 7

7. Posterior infold of valves with broad shelf having linear posterior edge .... ***Postasterope,*** new genus

Posterior infold of valves without broad shelf with linear posterior edge .... ***Parasterope***

Parasterope Kornicker, 1975

TYPE-SPECIES.—*Asterope muelleri* Skogsberg, 1920:483; subsequent designation by Kornicker (1975:401).

DISTRIBUTION.—Members of the genus are widespread between latitudes of about 55°N to 65°S with a depth range of intertidal depths to 4303 m (Kornicker and Caraion, 1974:7).

COMPOSITION.—Excluding *Parasterope longungues* Poulsen, 1965, which is known from a female collected at a depth of about 900 m off St. Croix, Virgin Islands, this genus is represented in the study area by 5 species: *P. muelleri* (Skogsberg, 1920), *P. extrachelata* (Kornicker, 1958), *P. pollex* Kornicker, 1967 (in Bowman and Kornicker, 1967:9), *P. hulingsi* Baker, 1978, and *P. zeta*, new species. Only the species in the study area are included in the key.

Key to Selected Species of *Parasterope*

1. Carapace of adult female and juveniles pear-shaped in lateral view .... ***P. muelleri***
Carapace of adult female and juveniles elliptical in lateral view 2
2. Sixth limb with fewer than 5 bristles along ventral margin 3
Sixth limb with more than 10 bristles along ventral margin 4
3. Maxilla with beta-bristle on 1st endopodial joint .. ***P. zeta,*** new species
Maxilla without beta-bristle on 1st endopodial joint of maxilla .... ***P. hulingsi***
4. First antenna with 6 dorsal bristles on 3rd joint; c-bristle of 2nd endopodial joint of mandible claw-like .... ***P. extrachelata***
First antenna with 5 dorsal bristles on 3rd joint; c-bristle of 2nd endopodial joint of mandible bristle-like .... ***P. pollex***

Parasterope muelleri (Skogsberg, 1920)

FIGURES 5–8

Cylindroleberis teres (Norman).—Müller, 1894::220, pl. 4: figs. 30, 43, pl. 5: figs. 6, 15, 24, 25, pl. 8: fig. 5.
Asterope teres (Norman).—Müller, 1912:46 [part].
Asterope Mulleri Skogsberg, 1920:483, fig. 89.—de Vos, 1957:8, pl. 3: fig. 2a–f[?].
Asterope elliptica Philippi.—Tressler, 1949:338, fig. 9 [part].
Asteropina mulleri (Skogsberg).—Kornicker, 1958:239, figs. 60a–f, 61a–f, 86a–d,g.
Asterope mulleri Skogsberg.—Reys, 1965:258 [listed] [?].
Parasterope muelleri (Skogsberg).—Poulsen, 1965:370, figs. 122–124.— Hulings, 1969:418.—Kornicker, 1974b:36, fig. 16; 1981b:8, figs. 6–8.—Kornicker and Caraion, 1974:8, fig. 4, 5.
Asterope muelleri Skogsberg.—Puri, 1966:484 [listed].
Not *Asterope muelleri* Skogsberg.—Klie, 1940:409, figs. 7–10 [See Kornicker, 1976:11, 18].

HOLOTYPE.—Adult female on slides in Swedish State Museum, Stockholm (Skogsberg, 1920:484).

TYPE-LOCALITY.—English Channel, off Salcombe, coast of England.

MATERIAL.—See "Station Data with Specimens Examined."

DISTRIBUTION.—English Channel; off Mauritania; Mediterranian Sea. West Atlantic: Bermuda; east coast of Florida; Florida Keys; Bahamas; West Indies. Known depth range 1–175 m.

SUPPLEMENTARY DESCRIPTION OF ADULT FEMALE (Figures 5, 6).—Dorsal and ventral margins convex, some specimens slightly tumid; incisur placed just below valve middle; dorsal margin evenly rounded (Figure 5*a,b,h*).

Infold: Infold behind rostrum with 3 or 4 bristles along list, 2 bristles between list and incisur, and about 25 bristles anterior and dorsal to list; about 22–24 bristles on broad anteroventral infold; about 9–12 bristles along ventral infold to point opposite lowermost hyaline flap-like bristle on posterior list. List beginning near inner margin of anterior part of infold, extending along ventral infold and continuing on posterior infold where it broadens; posterior list with about 25 broad transparent flap-like bristles and about 14–17 small bristles forming row near bases of flap-like bristles; generally not more than 1 small bristle between adjacent flap-like bristles; 6–10 bristles between broad posterior list and posterior margin of valve, all bristles being con-

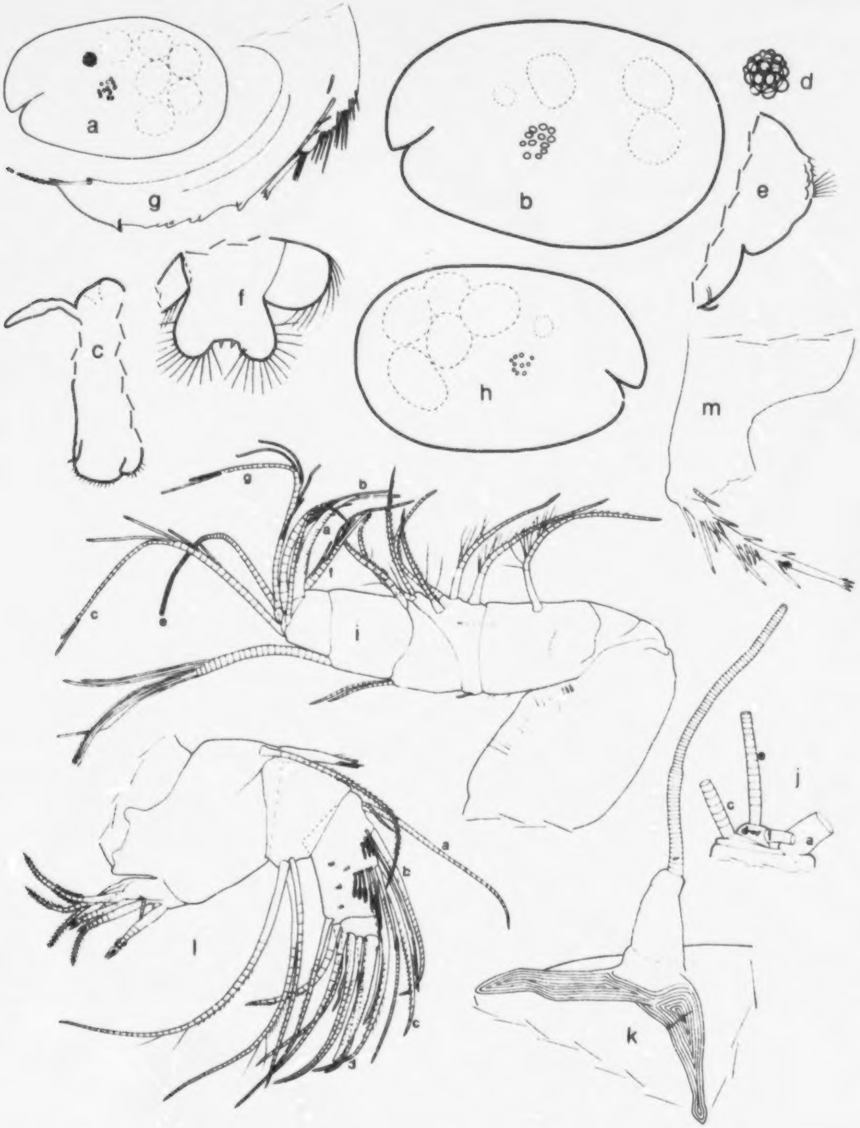

Figure 5.—*Parasterope mueller* (Skogsberg), USNM 88853, adult female, length 1.12 mm: *a*, lateral view of complete specimen showing left lateral eye, central adductor muscle attachments, and position of 6 eggs. USNM 152855, adult female, length 1.16 mm: *b*, lateral view of complete specimen showing outline of lateral eye (small dashed circle), central adductor muscle attachments, and outline of 3 eggs; *c*, anterior of body showing medial eye, bellonci organ, and upper lip; *d*, left lateral eye, anterior to left; *e*, posterior of body, lateral view, anterior to left, last claw of furca at lower left; *f*, dorsal view of upper lip with lateral flaps. USNM 152856, adult female, length 1.02 mm: *g*, coxale endite of mandible. USNM 152854, adult female, length 0.99 mm: *h*, lateral view of complete specimen showing outline of right lateral eye, central adductor muscle attachments, and position of 5 eggs; *i*, right 1st antenna, medial view; *j*, tip of left 1st antenna with part of a-, c-, d-, e-, f-bristles, lateral view; *k*, endopodite of left 2nd antenna, medial view; *l*, left mandible, medial view (coxale endite broken off); *m*, ventral branch of coxale endite.

fined to ventral half of posterior infold.

Vestment: Clusters of long hairs present on vestment just proximal to anterodorsal infold.

Selvage: Faint, fringed, lamellar prolongation present along proximal part of lower margin of incisur.

Size: USNM 152854, length 0.99 mm, height 0.61 mm, height 77 percent of length; USNM 152855, length 1.16 mm, height 0.75 mm, height 65 percent of length; USNM 152856, length 1.02 mm, height 0.64 mm, height 63 percent of length; USNM 152852, 3 ovigerous females: length 1.18 mm, height 0.72 mm, height 61 percent of length; length 1.05 mm, height 0.65, height 62 percent of length; length 1.13 mm, height 0.71 mm, height 63 percent of length; USNM 158366, length 1.17 mm, height 0.72 mm, height 62 percent of length; USNM 88853, length 1.12, height 0.70 mm, height 63 percent of length.

First antenna (Figure 5*i,j*): Medial surface of 1st joint with long hairs and 3 minute but stout spines at middle of distal margin; lateral surface with long hairs and few slender spines on dorsal half; lateral surface of 2nd joint with few spines forming rows near dorsal margin and 1 short distal bristle with faint marginal spines; medial surface with few spines forming rows; dorsal margin with long spinous midbristle; 3rd joint short, triangular, delimited by well-defined sutures; ventral margin with minute bristle, dorsal margin with 6 spinous bristles; 3rd and 4th joints combined forming square; distal margin of 4th joint concave on both medial and lateral surfaces; ventral margin of 4th joint with few short spines and 2 bare terminal bristles reaching past distal end of 5th joint; dorsal margin of 4th joint with 1 long spinous bristle; sensory bristle of 5th joint with 6 terminal filaments including stem; medial bristle of 6th joint reaching just past a-claw of 7th joint, with short marginal spines. Seventh joint: a-claw with minute teeth proximally along concave margin; b-bristle reaching just past tip of a-claw, with 3 distal marginal filaments excluding stem; c-bristle reaching just past tip of sensory bristle of 5th joint, with 4 marginal filaments near middle and 1 shorter filament near tip. Eighth joint: d-bristle absent or represented by minute spine; e-bristle about same length as b-bristle, bare with blunt tip; f-bristle bent dorsally, about same length as b-bristle, with 3 short marginal filaments near middle and 1 near tip; g-bristle almost as long as c-bristle, with 4 marginal filaments near middle and 1 near tip.

Second antenna (Figure 5*k*) Protopodite with short distomedial bristle and slender spines forming rows on dorsal half of medial surface. Endopodite very weakly 3-jointed, 3rd joint without visible suture separating it from 2nd joint, with long terminal bristle. Exopodite : 1st joint with minute medial bristle on distal margin, and few long distal hairs on dorsal margin; bristle of 2nd joint reaching just past distal end of 9th joint, with spines along ventral margin; bristles of joints 2–8 with slender spines along middle of ventral margin and with natatory haris; 9th joint with 4 bristles (2 short, bare, or with short marginal hairs, 1 medium length with natatory hairs, 1 long (ventral) with natatory hairs and also slender ventral spines proximally along ventral margin); joints 3 to 8 with basal spines; basal spine of 8th joint ½ to ¾ length of 9th joint, others smaller; lateral spine of 9th joint 50 to 95 percent length of 9th joint; joints 3–8 with short spines forming row along distal lateral margin.

Mandible (Figure 5*g,l,m*): Ventral branch of coxale endite with 3 minute teeth and 1 or 2 minute spines; dorsal branch with pair of nodes followed by 4 or 5 low nodes and short main spine; tip of branch coming to sharp point; distal bristle on ventral margin hirsute, with base anterior to tip of branch; short slender bristle present near base of ventral branch. Basale endite with 4 end bristles with stout proximal and more slender distal spines, 3 triaenid bristles with 3–5 pairs of marginal spines excluding terminal pair, 1 dwarf bristle, and an elongate glandular peg; dorsal margin of basale with 2 long, spinous, terminal bristles (USNM 152844 aberrant in

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having only 1 bristle); ventral margin and medial surface bare. Exopodite reaching distal end of 1st endopodial joint, hirsute, with 2 short subterminal bristles. Endopodite: 1st joint with 3 long ventral bristles (medial bristle with short marginal spines; remaining 2 bristles with marginal spines along middle part followed by 2 long stout spines); ventral margin of 2nd joint with 3 terminal bristles, 2 or more of these with short marginal spines; dorsal margin of 2nd joint with stout a-, b-, c-, and d-bristles (all except a-bristle with faint spines along middle of ventral and dorsal margins, base of c-bristle slightly stouter than bases of other bristles); 1 short bare bristle proximal to a-bristle; long, slender, lateral bristle between b- and c-bristles almost same length as b-bristle; long slender bristle between c- and d-bristles almost as long as c-bristle; medial side with 0 or 1 cleaning bristle between a- and b-bristles; 3 cleaning bristles just distal to base of b-bristle and 5–6 cleaning bristles just proximal to base of c-bristle, 1 long slender bristle with short marginal spines just distal to base of d-bristle, and short spines forming rows; end joint with stout dorsal claw with spines along ventral margin, and 4 long and 1 short bristle, all with short marginal spines.

Maxilla (Figure 6*a*): Endite I with 4 bristles (3 long and 1 short); endite II with 3 long bristles; epipodial appendage reaching to bout middle of dorsal margin of basale, without hairs. Basale: medial surface near dorsal margin with short proximal and slightly longer distal bristle; dorsal margin and medial surface hirsute; ventral margin with 1 short proximal bristle and long, spinous, terminal bristle; lateral surface with short proximal bristle. Endopodite: 1st joint with short dorsal bristle and bare beta-bristle; end joint with 1 long bristle with few very faint marginal spines (bristle 50 to 100 percent longer than beta-bristle).

Fifth Limb (Figure 6*b*): Lateral surface of comb with stout spinous bristle reaching past end of comb, 1 short slender bristle just ventral to base of stout bristle, and 4 bristles near ventral margin. Epipodial appendage with 57 bristles.

Sixth Limb (Figure 6*c*): Medial surface with 1 short spine in proximal anterior corner and 2 short endite bristles near anterior margin (lower bristle with base some distance from anterior margin); anteroventral corner with 1 long spinous bristle and 1 short bare bristle; lateral flap with long hairs along anterior margin; ventral margin of end joint with 14–16 spinous and hirsute bristles along posterior two-thirds.

Seventh Limb (Figure 6*d*): Proximal and distal groups each with 6 bristles, 3 on each side; each bristle with up to 4 bells; terminus with opposing combs, each with 12–13 spinous teeth.

Furca (Figures 5*e*, 6*h*): Each lamella with 9 claws of which posterior 2 pairs are bristle-like and oriented posteriad; main claws with short and long teeth along posterior margin.

Rod-shaped Organ (Figures 5*c*, 6*e*): Elongate, broadening in middle, with rounded tip.

Eyes (Figures 5*c*, *d*, 6*e*,*f*): Medial eye bare; lateral eye about same size as medial eye, pigmented, with about 18 ommatidia.

Upper Lip (Figures 5*c*,*f*, 6*g*): With a pair of hirsute anterior lobes and 2 hirsute lateral flaps; each anterior lobe with 1 or 2 anterior spines, anterior of saddle between lobes with 1 or 2 spines.

Posterior of Body (Figures 5*e*, 6*h*): Posterodorsal corner with tuft of long spines; margin dorsal to spines with minute scallops bearing short spines.

Y-Sclerite (Figure 6*h*): Normal for genus.

Eggs (Figure 5*a*,*b*,*h*): USNM 152854, 8 eggs; USNM 152855, 9 eggs: USNM 152856, 11 eggs, USNM 158366, 3 eggs; USNM 88853, 7 eggs.

DESCRIPTION OF ADULT MALE (Figures 7, 8).—Carapace elongate, posterior evenly rounded, rostrum overlapping incisur located near middle of anterior margin; bristles forming vertical row near posterior end of valve (Figure 7*a*).

Infold: Infold behind rostrum with 5 bristles along list, 5 bristles between list and incisur, and about 32 bristles anterior and dorsal to list; about

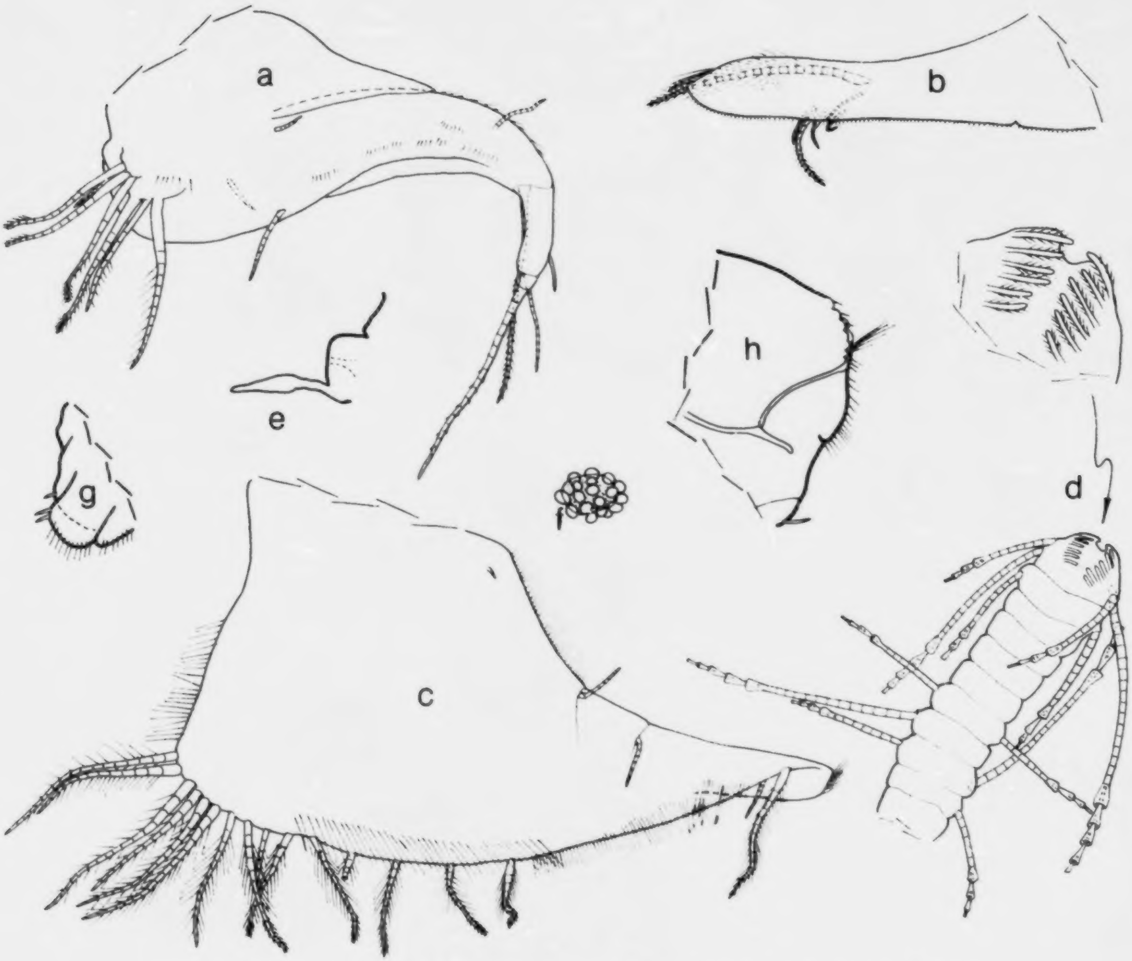


FIGURE 6.—*Parasterope muelleri* (Skogsberg), USNM 152856, adult female, length 0.99 mm: *a*, left maxilla, medial view; *b*, comb of right 5th limb, medial view; *c*, left 6th limb, medial view; *d*, 7th limb; *e*, medial eye and bellonci organ; *f*, left lateral eye; *g*, anterior of body showing upper lip, lateral view; *h*, posterior of body showing posterior claw of furca in lower left, Y-sclerite, girdle, and hairs of posterodorsal corner.

29 bristles on broad anteroventral infold: about 14 bristles along ventral infold to point opposite lowermost, hyaline, flap-like bristle on posterior list. List beginning near inner margin of anterior part of infold, extending along ventral infold, and continuing on posterior infold where it broadens; posterior broad list with about 28 transparent flap-like bristles and about 19 minute bristles (not more than 1 minute bristle between adjacent flap-like bristles); about 18 bristles between broad posterior list and posterior margin of valve (all bristles confined to ventral half of posterior infold). Infolds of left and right valves similar.

Vestment: Clusters of long hairs present on vestment just proximal to anterodorsal infold.

Central Adductor Muscle Attachments (Figure 8*f*): Consisting of about 12 individual ovoid attachments.

Size: USNM 158392, length 1.57 mm, height

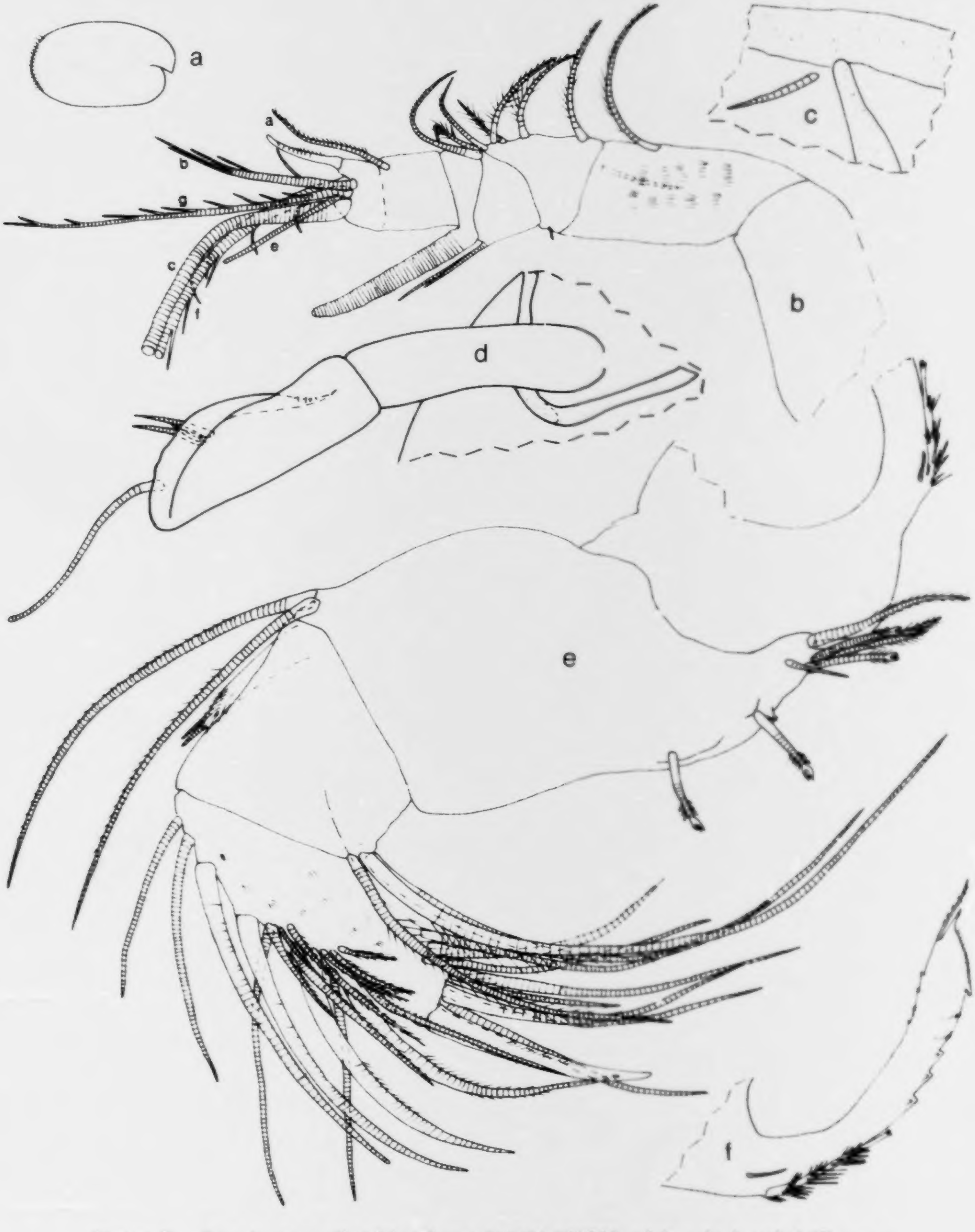


FIGURE 7.—*Parasterope muelleri* (Skogsberg), USNM 158392, adult male, length 1.57 mm: *a*, lateral view of complete specimen showing outline of right lateral eye; *b*, right 1st antenna, medial view; *c*, medial bristle of protopodite of right 2nd antenna, medial view; *d*, endopodite of right 2nd antenna, medial view; *e*, right mandible, medial view (coxale endite broken off); *f*, right mandible, medial view.

0.94 mm. USNM 158603 (31 adult males, 4 measured): length 1.55 mm, height 0.91 mm, length 1.43 mm, height 0.82 mm, length 1.40 mm, height 0.83 mm; length 1.42 mm, height 0.85 mm.

First Antenna (Figure 7*b*): 1st joint with few minute lateral spines forming row near middle of dorsal margin. 2nd joint with abundant medial spines, lateral spines forming rows near dorsal margin, 1 bare lateral bristle, and 1 spinous dorsal bristle. Suture between 3rd and 4th joints well defined on medial surface, less well defined near middle on lateral surface; 3rd joint with 1 small ventral bristle and 6 spinous dorsal bristles; 4th joint with 2 terminal ventral bristles and 1 longer dorsal bristle. Sensory bristle of short 5th joint stout, with abundant sensory filaments (filaments not shown on illustrated limb); terminal filaments stouter than others. Suture between 6th and 7th joints not well defined medially but more clearly defined laterally; medial bristle of 6th joint spinous, with base near dorsal margin. 7th limb: a-claw on short pedestal, and with dorsal spines; b-bristle more than twice length of a-claw, with 4 marginal filaments; c-bristle extremely long, with about 27 filaments. 8th joint: d-bristle absent; e-bristle bare, longer than a-claw; f-bristle very long, with about 24 filaments; g-bristle about one-third longer than b-bristle, with 8 or 9 marginal filaments.

Second Antenna: Protopodite with small, distal, medial bristle, otherwise bare (Figure 7*c*). Endopodite 3-jointed (Figure 7*d*): 1st joint elongate, bare; 2nd joint elongate with 3 ventral bristles, one much shorter than others; 3rd joint elongate, with 1 proximal bristle with blunt tip; tip of joint with transverse ridges. Exopodite: 1st joint elongate with distal hairs; 2nd joint 3–4 times length of 3rd joint; remaining joints decreasing in size gradually; joint 3–8 with minute basal spines (some with minute spines at tip); 9th joint with small, squarish, lateral spine with minute spines at tip; joints 2–8 with minute spines forming row along distal margin, and distal hairs on dorsal margin; bristles of joints 2–9 with natatory hairs, no spines; 9th joint with 4 bristles (dorsal of these smaller than others).

Mandible (Figure 7*e,f*): Coxale endite with slender medial bristle at base of ventral branch (Figure 7*f*); ventral branch with spines forming 4 oblique rows, and tip with 3 small teeth; ventral margin of dorsal branch with 3 paired nodes followed by 2 smaller nodes and small main spine; tip of branch tapering to fine point; dorsal margin with hirsute bristle with base set back from tip of branch, and few serrations proximal to bristle. Basale endite with 4 end-type bristles, 3 triaenid bristles with 4–5 paired spines excluding terminal pair, 1 dwarf bristle, and glandular peg. Basale: ventral margin with 1 triaenid bristle with 3–4 paired spines excluding terminal pair; dorsal margin with 2 long spinous bristles. Exopodite not quite reaching distal end of dorsal margin of 1st endopodial joint, hirsute distally, with 2 small subterminal bristles. 1st endopodial joint with 3 long bristles (lateral of these with short marginal spines, others with both long and short spines). 2nd endopodial joint: ventral margin with 3 bristles with short marginal spines; dorsal margin with 2 proximal bristles and stout a-, b-, c-, and d-bristles (last 2 with marginal spines); medial surface with spines and hairs forming rows, 8 cleaning bristles forming 2 or 3 rows between b- and c-bristles (5 bristles in distal row) and 1 long slender bristle just distal to base of d-bristle; lateral surface with long bristle between b- and c-bristles and between c- and d-bristles. End joint with stout pectinate claw and 5 spinous bristles (medial of these short).

Maxilla (Figure 8*a*): Epipodite not reaching middle of dorsal margin of basale, with hairs on pointed tip. Basale: dorsal margin hirsute, with 1 proximal and 1 distal bristle (both bristles with bases on medial surface); lateral surface with 1 short proximal bristle; ventral margin with 1 proximal bristle, 1 small distal bristle, and 1 long spinous terminal bristle. Endopodite: 1st joint with 1 short anterior bristle and 1 short beta-bristle; end joint with terminal bristle three or four times length of beta-bristle. Endite I with 4 bristles (3 long, 1 short); endite II with 3 long bristles.

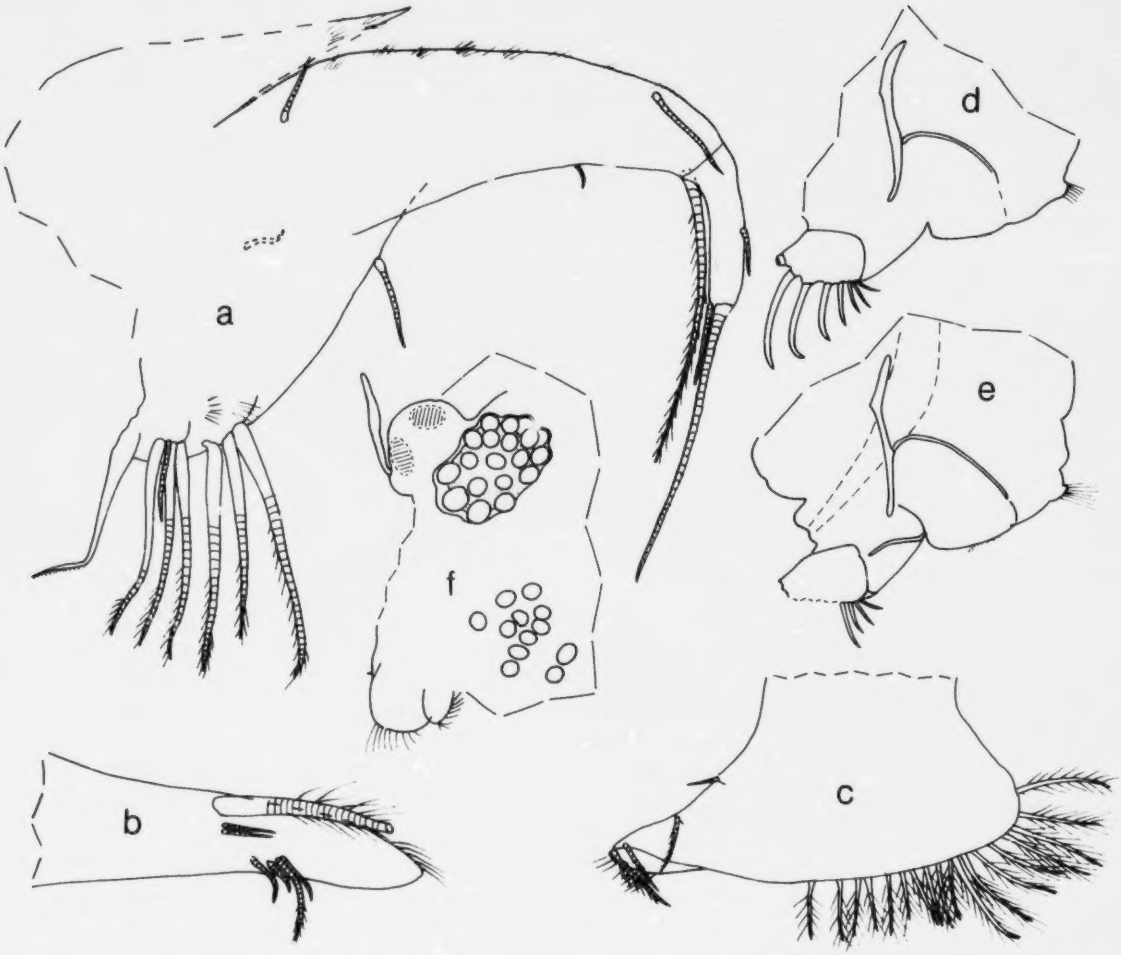


FIGURE 8.—*Parasterope muelleri* (Skogsberg), USNM 158392, adult male, length 1.57 mm: *a*, left maxilla, medial view; *b*, comb of right 5th limb, lateral view; *c*, right 6th limb, medial view; *d*, posterior of body showing furca with part of claw 1 missing, left Y-sclerite, left girdle, hairs forming cluster at posterodorsal corner; *e*, same as *d* but showing outline of gut and position of anus; *f*, anterior half of body showing left lateral eye, medial eye and bellonci organ, upper lip with lateral flap, and ends of central adductor muscles.

Fifth Limb (Figure 8*b*): Lateral side of comb with stout, spinous, exopodial bristle, 2 slender bristles ventral to base of exopodial bristle, and 2 pairs of bristles near ventral margin.

Sixth Limb (Figure 8*c*): Anterior margin with 1 upper and 1 lower bristle at endite sutures; anterior tip of skirt with 2 spinous bristles (smaller of these about ¾ length of other); posteroventral margin with 17 or 18 hirsute bristles (those along posterior corner longer than others); limb hirsute.

Seventh Limb: 6 bristles in proximal group (3 on each side); 6 bristles in distal group (3 on each side); each bristle with 3–4 bells; bristles on each side consisting of long bristle between 2 short bristles; terminus consisting of opposing combs, each with 7 or 8 spinous teeth.

Furca (Figure 8*d,e*): Each lamella with 8 claws (posterior 2 of these ringed, bristle-like, but none oriented backwards); main claws with long and short teeth along posterior margins; claw 1 of right lamella anterior to claw 1 of left lamella.

Bellonci Organ (Figure 8*f*): Elongate, broadening near middle, with rounded tip.

Eyes (Figure 8*f*): Medial eye bare, with amber pigment. Lateral eye larger than medial eye, with amber pigment and 19–20 ommatidia.

Upper Lip (Figure 8*f*): Consisting of 2 hirsute lobes, 1 on each side of saddle bearing faint anterior spine. Hirsute lateral flaps present on each side of mouth.

Copulatory Organ: Small.

Posterior of Body (Figure 8*d,e*): With very small, hirsute, dorsal process.

Y-Sclerite (Figure 8*d,e*): Typical for genus.

REMARKS.—The adult males from Abaco Island, Bahamas, referred herein to *P. muelleri*, are larger than specimens previously referred to the species. Another difference is that the smaller of the bristles on the anteroventral corner of the 6th limb of the large males is about ¾ the length of the longer bristle, not ½ as on specimens previously referred to the species. Because variability of this character was not studied I find it expedient to refer these males to *P. muelleri*.

Tressler (1949:338) reported 6 specimens of *Asterope elliptica* Philippi, 1840, from Tortugas. Only 4 specimens so labeled are in the collection of the National Museum of Natural History. Three of the specimens (USNM 88853, 88854, 88856) are referred herein to *Parasterope muelleri*. One of the specimens (USNM 88860) had previously been referred to *Skogsbergia lerneri* (Kornicker, 1958) (Kornicker, 1984b:20).

Parasterope extrachelata (Kornicker, 1958), new combination

FIGURES 9, 10

Asteropina extrachelata Kornicker, 1958:241, figs. 65A–E, 66A–E, 87C,F,I.

Synasterope extrachelata.—Poulsen, 1965:355, 401, 402, 433, 434, 469.

HOLOTYPE.—Specimen number 118-1, ovigerous female, length 1.88, height 1.01 mm; unique specimen, not extant.

TYPE-LOCALITY.—Cavelle Pond, salt water pond on South Bimini, Great Bahama Bank.

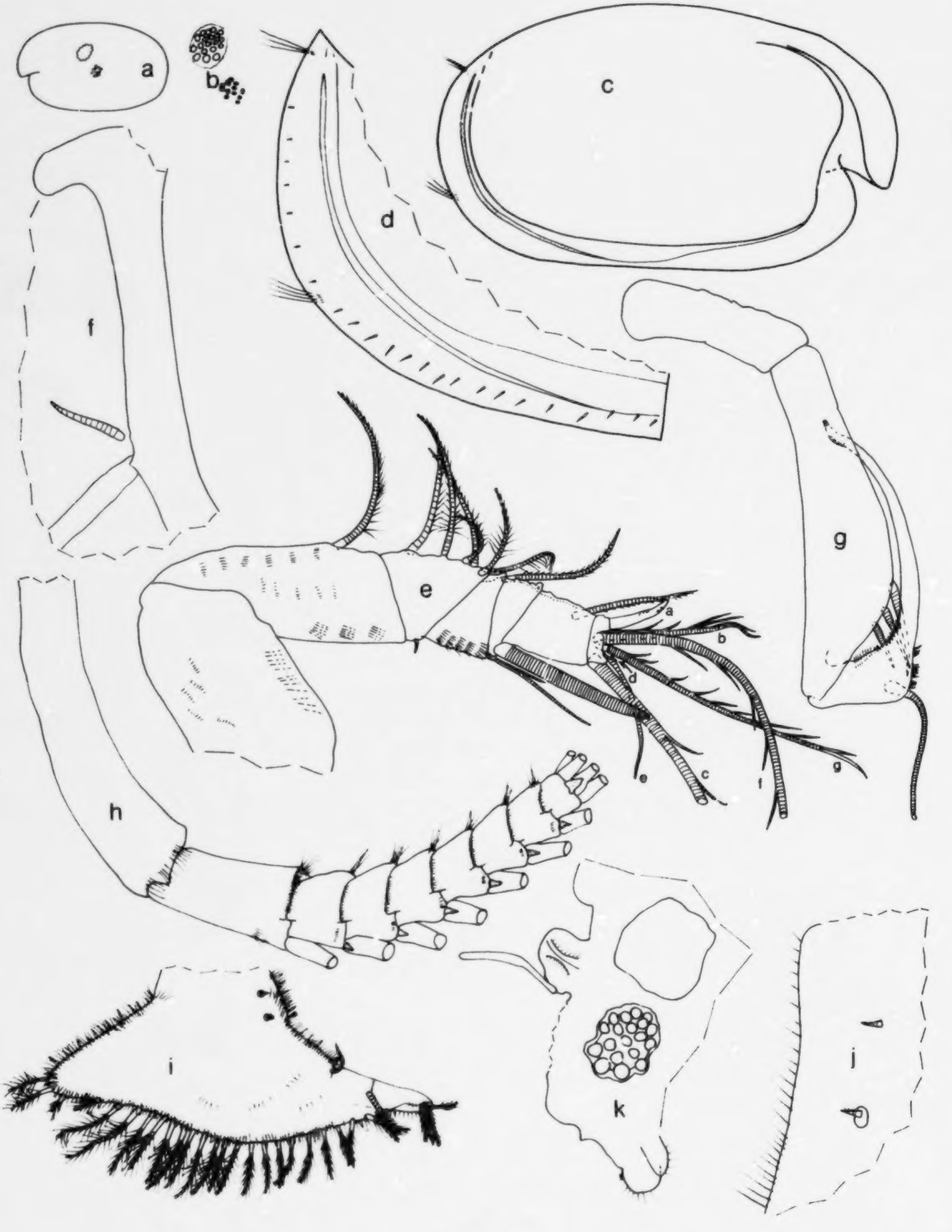
MATERIAL.—Abaco, Little Bahama Bank: USNM 158385, 1 adult male; USNM 158391, 3 adult males.

DISTRIBUTION.—Bimini, Great Bahama Bank, and Abaco, Little Bahama Bank; shallow water.

DESCRIPTION OF ADULT MALE (Figures 9, 10).—Carapace elongate with dorsal margin slightly more convex than ventral margin; posterior margin evenly rounded; surface with long hairs forming vertical row near posterior margin (hairs not shown on Figure 9*a*, and only hairs at dorsal and ventral ends of row shown in Figure 9*c,d*); surface smooth.

Infold (Figure 9*c,d*): Infold behind rostrum with about 11 fairly long bristles near tip of rostrum anterior to list; about 37 shorter bristles forming uneven rows near and parallel to anterodorsal margin of value; about 12 bristles present between list and incisur. Anteroventral infold with about 35 bristles mostly near anteroventral valve margin; ventral infold with about 15 short bristles between narrow list and ventral margin of valve. List with anterior end close to inner margin of infold, but bending ventrally and approaching edge of valve near

FIGURE 9.—*Parasterope extrachelata* (Kornicker), USNM 158385, adult male, length 1.73 mm: *a*, lateral view of complete specimen showing outline of left lateral eye and central adductor muscle attachments; *b*, left lateral eye and central adductor muscle attachments; *c*, inside view of left valve showing inner edge of infold and list (bristles of infold and list not shown); *d*, detail of posterior of *c* showing bristles of infold; *e*, right 1st antenna, lateral view; *f*, medial bristle of protopodite of right 2nd antenna, medial view; *g*, endopodite of left 2nd antenna, medial view; *h*, exopodite of left 2nd antenna, lateral view; *i*, left 6th limb, medial view; *j*, proximal anterior corner of right 6th limb, medial view; *k*, anterior part of body showing bellonci organ and medial eye, outline of heart (above lateral eye), lateral eye, upper lip with lateral flap.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middle of ventral margin, then bending dorsally and forming broad band on posteroventral and posterior infold (Figure 9*c*); about 19 short bristles present between broad list and posteroventral and posterior margin of valve (Figure 9*d*); broad posteroventral and posterior list with abundant transparent flap-like bristles (exact number obscure on USNM 158385); no processes observed on posterior infold.

Size: USNM 158385: length 1.73 mm, height 1.01 mm. USNM 158391, 3 specimens: length 1.70 mm, height 0.97 mm; length 1.68 mm, height 0.97 mm; length 1.80 mm, height 0.98 mm.

First Antenna (Figure 9*e*): 1st joint spinous. 2nd joint spinous, with 1 spinous dorsal bristle. 3rd joint triangular, with 6 long, spinous, dorsal bristles and 1 short ventral bristle. 4th joint triangular with spines forming rows near ventral margin, with 3 terminal bristles (1 dorsal, 2 ventral); distal end of dorsal margin forming node. Dorsal margin of 5th joint with 4 nodes (distal node larger than others); sensory bristle with abundant, narrow, marginal filaments and stouter terminal filaments (filaments left off sensory bristle of illustrated limb). 6th joint with undulate dorsal margin; medial bristle with short marginal spines. 7th joint: a-claw short, about same length as dorsal margin of 6th joint, shorter than bristle of 6th joint, bare, curving slightly dorsally, base on short pedestal; b-bristle about twice length of a-claw, with 2 short proximal filaments and 3 longer, distal, marginal filaments; c-bristle extremely long and stout, with about 19 marginal filaments. 8th joint: d-bristle represented by short, peg-like, bare, unringed bristle; e-bristle, bare, slightly shorter than b-bristle, with blunt tip; f-bristle extremely long, with about 20 marginal filaments; g-bristle about twice length of b-bristle, with about 9 marginal filaments.

Second Antenna (Figure 9*f–h*): Protopodite with short medial bristle (Figure 9*f*), but without spines or hairs. Endopodite 3-jointed (Figure 9*g*): 1st joint elongate, bare; 2nd joint elongate, with 3 ventral bristles; 3rd joint elongate, recurved on 2nd joint, with proximal bristle, and proximal spines forming rows; narrow tip with several ridges and small, spinous, terminal process. Exopodite (Figure 9*h*): elongate 1st joint with long, distal, lateral hairs; 2nd joint about twice length of 3rd joint; joints 3–8 with short basal spines, less than half length of following joint; 9th joint with lateral spine larger than basal spine of 8th joint; distal margin of joints 2–8 with short spines and long dorsal hairs; bristles of joints 2–8 and all 4 bristles of 9th joint with natatory hairs, no spines.

Mandible (Figure 10*a,b*): Coxale endite with minute medial bristle at base of ventral branch; ventral branch with stout spines forming 4 oblique rows and pointed tip with several spines; ventral margin of dorsal branch with 2 pairs of pointed processes followed by 2 pairs of low processes (1 pointed, 1 rounded), then slightly undulating margin just proximal to short main spine; margin between main spine and finely drawn out tip of branch with small spines; dorsal margin of dorsal branch with distal serrations and subterminal bristle having spines at base (Figure 10*b*). Basale endite with 4 pectinate end bristles, 3 triaenid ventral bristles with 4–5 pairs of short spines and long slightly recurved pair of long terminal spines, 1 slender dwarf bristle, and glandular peg. Basale with 1 triaenid bristle near base of endite; dorsal margin with 2 long terminal bristles with short, faint, marginal spines. Exopodite about two-thirds length of dorsal margin of 1st endopodial joint, hirsute distally, and with 2 short terminal bristles. 1st endopodial joint with 3 long, spinous, ventral bristles. 2nd endopodial joint: dorsal margin with pectinate a-, b-, c-, and d-bristles; c-bristle claw-like, wider than d-bristle at base and about ½ its length; long lateral bristle present between b- and c-bristles; medial side with spines forming rows, cleaning bristles forming 2 oblique rows between b- and c-bristles (3 bristles in proximal row, 6 bristles in distal row), and 1 relatively short spinous bristle just distal to base of d-bristle; ventral margin with 3 long, spinous, terminal bristles. End joint with stout, bare, dorsal claw, linear except for slight curvature near tip, and 5 bristles (4 long, 1 short and medial).

Maxilla (Figure 10*c*): Epipodial appendage

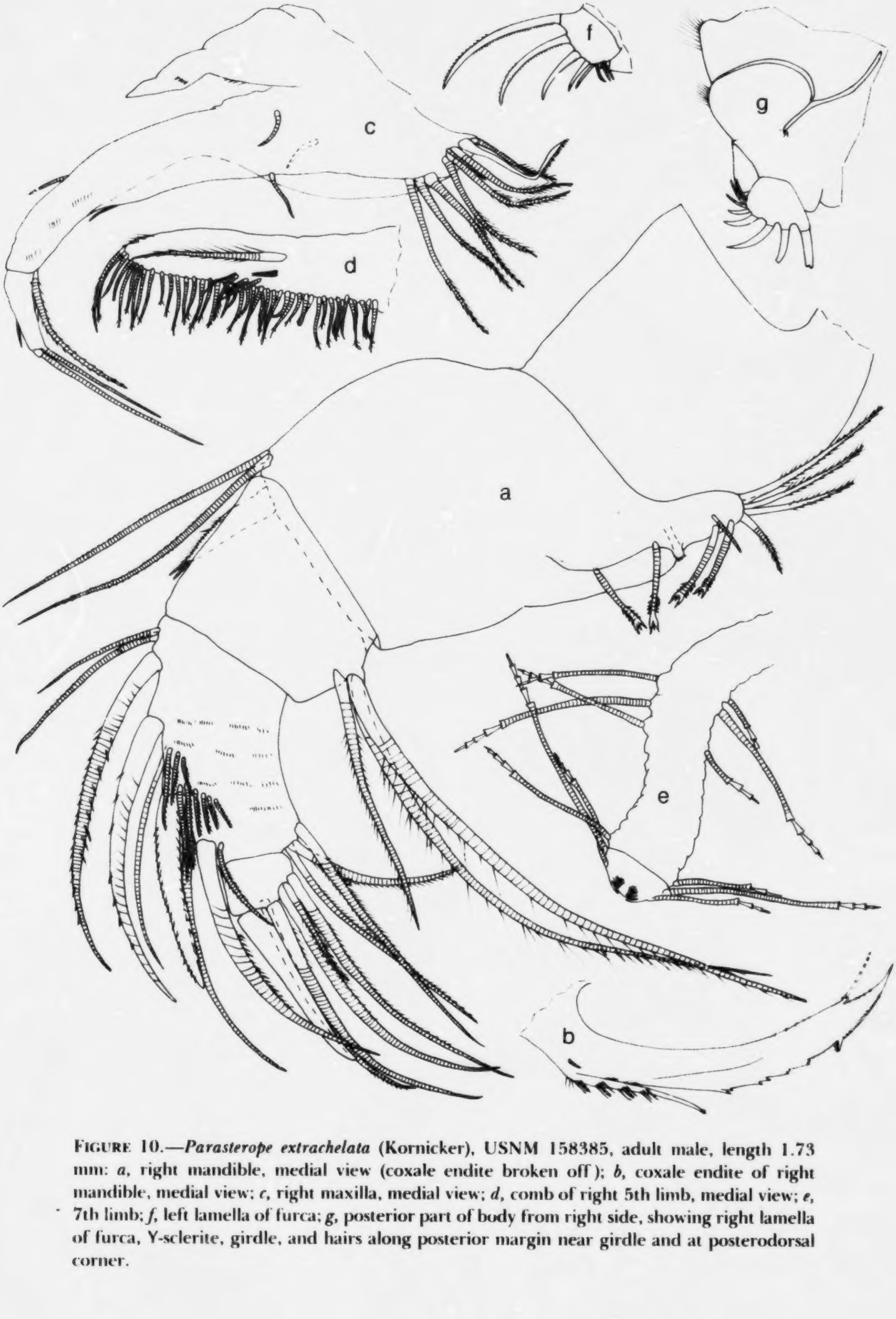


FIGURE 10.—*Parasterope extrachelata* (Kornicker), USNM 158385, adult male, length 1.73 mm: *a*, right mandible, medial view (coxale endite broken off); *b*, coxale endite of right mandible, medial view; *c*, right maxilla, medial view; *d*, comb of right 5th limb, medial view; *e*, 7th limb; *f*, left lamella of furca; *g*, posterior part of body from right side, showing right lamella of furca, Y-sclerite, girdle, and hairs along posterior margin near girdle and at posterodorsal corner.

with slender tip not quite reaching middle of dorsal margin of basale, with few faint hairs and spines. Endite I with 4 bristles (3 long, spinous, 1 short, bare); endite II with 3 long spinous bristles. Basale: medial side with 1 proximal bristle near dorsal margin; lateral side with 1 proximal bristle; dorsal margin with 1 short distal bristle; ventral margin with 1 short proximal bristle, 1 minute distal bristle, and 1 long, spinous, terminal bristle. Endopodite: 1st joint with short alpha-bristle and long slender beta-bristle; 2nd joint with single terminal bristle reaching past beta-bristle of 1st joint.

Fifth Limb (Figure 10*d*): Comb with stout, spinous, exopodial bristle not reaching past distal end of comb; 2 slender bristles present ventral to base of exopodial bristle; 2 pairs of bristles present near ventral margin of comb just anterior to base of stout exopodial bristle.

Sixth Limb (Figure 9*i,j*): Medial side with 2 minute bristles in anterodorsal corner (distal of these spinous) (Figure 9*j*). Anterior margin with upper and lower suture, each with medial bristle (lower bristle with base relatively long distance from anterior margin). Lateral anteroventral flap with marginal hairs and single, small, hirsute bristle. Anterior tip of skirt with 2 or 3 hirsute ventral bristles; ventral margin and posteroventral corner of skirt with 22–24 hirsute bristles (those on posteroventral corner not longer than others). Anterior, posterior, and dorsal margins of skirt hirsute; hairs also on medial and lateral surfaces.

Seventh Limb (Figure 10*e*): Proximal and distal groups each with 6 bristles (3 on each side), each bristle with up to 4 bells; terminus with opposing combs, each with about 12 spinous teeth.

Furca (Figure 10*f,g*): Each lamella with 8 claws (posterior 3 bristle-like and bent backwards); claws 1–5 with teeth along posterior margins; claws 1 and 2 with hairs along anterior margins; claws 6–8 weakly ringed; claw 1 of right lamella anterior to claw 1 of left lamella.

Bellonci Organ (Figure 9*k*): Elongate, narrower in proximal half than in distal half, with rounded tip.

Eyes (Figure 9*b,k*): Medial eye bare, light amber in color (Figure 9*k*). Lateral eye amber in preserved speciman (originally black?), larger than medial eye, with 19 divided ommatidia (Figure 9*k*).

Upper Lip (Figure 9*k*): Consisting of 2 hirsute lobes, each with 2 or 3 minute anterior spines; lateral flap on each side of mouth hirsute.

Posterior of Body (Figure 10*g*): With hairs just ventral to sclerotized girdle; dorsum consisting of low curved process with long hairs along posterior margin.

Y-Sclerite (Figure 10*g*): Typical for subfamily.

Heart (Figure 9*k*): Larger than lateral eye.

REMARKS.—Poulsen (1965:355, 401) referred *P. extrachelata* to the genus *Synasterope* because in the description of the species, Kornicker (1958, fig. 65E) did not show a long lateral bristle between the b- and c-bristles of the 2nd endopodial joint of the mandible. The adult male described herein, except for the presence of the long lateral bristle, agrees in other characters with the female holotype, and there is little doubt that they are members of the same species. Unfortunately, the holotype is not extant, nor are there any females in the present collections, so that the absence of the long lateral bristle on the female can not be verified at this time. Species of *Synasterope* of which both sexes are known do not have a long lateral bristle on either the male or female. Therefore, it seems likely that the holotype has either an aberrant mandible, or that the appendage was not accurately drawn.

Parasterope pollex **Kornicker, 1967**

FIGURES 11–15

Cylindroleberis mariae.—Cushman, 1906:366, pl. 29.—Wass, 1965:28.—Wass and Andrews, 1979:212, 275. [Not Baird, 1850:257.]

Parasterope pollex Kornicker, in Bowman and Kornicker, 1967:9, figs. 4–7, pl. 1a, b.—Hulings, 1969:412.—Sohn, 1974:725, fig. 1g–i.—Bradford, 1975:3, 11, fig. 1a–c.—Siddiqui and Grigg, 1975:374.—Watling, 1975:281–284, 290, 292, 293, 304, 305.—Parker, 1975:107, 132, 140, 147, 170, 173, 175.—Stiles and Blake, 1976:230.—Baker, 1977:250.—Sheridan and Livingston, 1983:413.

Parasterope polex.—Hiruta, 1980:42

Parasterope sp. indet.—Kornicker, 1977:792, 794, fig. 3.

HOLOTYPE.—USNM 114048, ovigerous female, on slides and in alcohol.

TYPE-LOCALITY.—Hadley Harbor, Massachusetts.

MATERIAL.—See "Station Data with Specimens Examined."

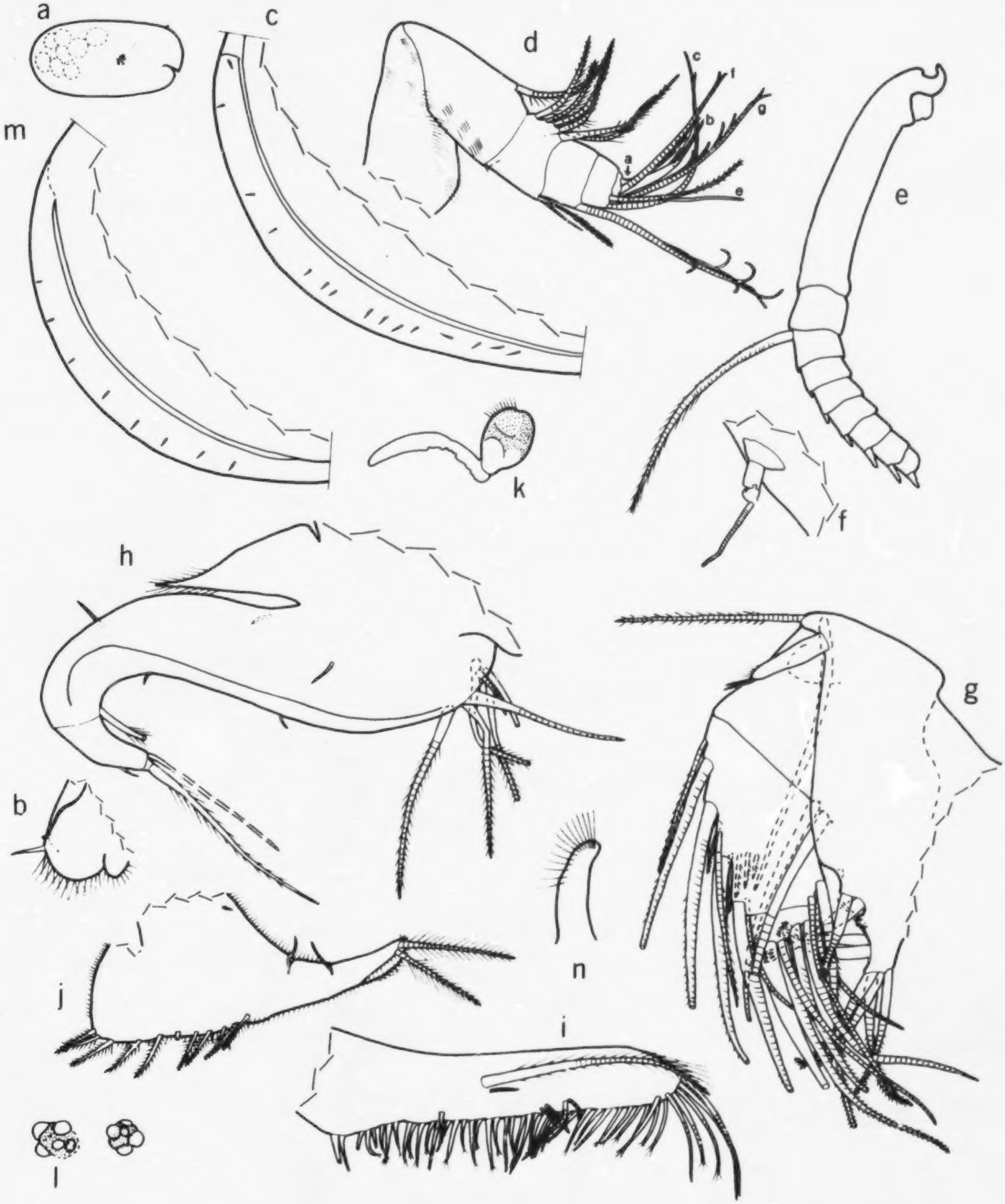
DISTRIBUTION.—Petpeswick Inlet, Nova Scotia, Canada; Hadley Harbor and Great Harbor, Woods Hole, Martha's Vineyard, Massachusetts; Lake Montauk, Long Island Sound, New York; Rehobeth Bay, Delaware; mouth of York River, Virginia; Tampa Bay, Placida Harbor, Alligator Harbor Anclote Anchorage, Florida.

SUPPLEMENTARY DESCRIPTION OF ADULT FEMALE (Figure 11).—Ventral and dorsal margins slightly convex, subparallel to each other, greatest height around middle (Figure 11*a*); anterior and dorsal margins evenly rounded; incisur below midheight.

Infold: Behind rostrum with 2 or 3 bristles along list, 4 or 5 bristles between list and incisur, and about 25 bristles anterior and dorsal to list; about 11 bristles on broad anteroventral infold; about 11 bristles along ventral infold to point near lowermost hyaline flap-like bristle on posterior list; broad posterior list with about 30 flap-like bristles and about 20 small bristles; 8–15 bristles between broad posterior list and posterior margin of valve (Figure 11*c,m*).

Size: USNM 144007, length 1.45 mm, height 0.73 mm, height 50 percent of length; USNM 152316A, length 1.38 mm, height 0.68 mm, height 50 percent of length, USNM 152316B, length 1.43 mm, height 0.68 mm, height 48 percent of length. USNM 152315, 9 specimens: length 1.41 mm, height 0.68 mm, height 48 percent of length; length 1.38 mm, height 0.65 mm, height 47 percent of length; length 1.38 mm, height 0.69 mm, height 50 percent of length; length 1.43 mm, height 0.67 mm, height 47 percent of length; length 1.40 mm, height 0.71 mm, height 51 percent of length; length 1.37 mm, height 0.63 mm, height 46 percent of length; length 1.38 mm, height 0.70 mm, height 51 percent of length; length 1.43 mm, height 0.69 mm, height 48 percent of length; length 1.31 mm, height 0.64 mm, height 49 percent of length; USNM 156765, length 1.33 mm, height 0.64 mm, height 48 percent of length; USNM 157123, length 1.38 mm, height 0.69 mm, height 50 percent of length; USNM 156711, length 1.29 mm, height 0.62 mm, height 48 percent of length; 2 specimens from Tampa Bay returned to R. Virnstein, length 1.43 mm, height 0.68 mm, height 47 percent of length, length 1.50 mm, height 0.74 mm, height 50 percent of length; USNM 157612, length 1.34 mm, height 0.68 mm; USNM 157613, length 1.31 mm, height 0.69 mm; USNM 157611, length 1.30 mm, height 0.64 mm. USNM 156708, length 1.60 mm; height 0.77 mm; height 48 percent of length; USNM 156710, length 1.56 mm, height 0.74 mm, height 47 percent of length; USNM 143751, length 1.59 mm, height 0.84 mm, height 53 percent of length; USNM 152452, length 1.66 mm, height 0.84 mm, height 50 percent of length; USNM 152580, length 1.64 mm, height 0.81 mm, height 49 percent of length; specimen from Lake Montauk, Long Island, New York, length 1.49 mm, height 0.80 mm, height 54 percent of length.

First Antenna (Figure 11*d*): 1st joint with many long spines on medial surface and few clusters of short spines on lateral surface. 2nd joint with 1 spinous dorsal bristle and spines forming rows on lateral and medial surfaces. 3rd and 4th joints fused; combined joints shorter than wide. 3rd joint with 5 spinous dorsal bristles and 1 minute ventral bristle. 4th joint with 1 dorsal bristle with short marginal spines, and 2 slender ventral bristles, both with faint, short, marginal spines (lateral of the bristles reaching middle of 6th joint, other longer); dorsal margin of 4th joint concave. Sensory bristle of 5th joint with 6 terminal filaments. 6th joint with 1 long medial bristle with short marginal spines. 7th joint: a-bristle short, claw-like; b-bristle about twice length of a-bristle, with 2 proximal and 2 distal filaments excluding stem; c-bristle longer than b-bristle, with 6 filaments including stem. 8th joint: d-bristle absent or represented by minute spine; e-bristle bare, slightly shorter than b-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bristle; f-bristle about same length as b-bristle, forming angle with limb, with 3 short spinous filaments near middle and bifurcate tip; margin of f-bristle spinous distal to filaments near middle; g-bristle with 4 marginal filaments and bifurcate tip.

Second Antenna (Figure 11*e,f*): Protopodite with few hairs along dorsal margin, but without medial bristle. Endopodite distinctly 3-jointed with bare terminal bristle about 1½ times length of stem. Exopodite: 1st joint bare; joints 3–8 with short spines forming row along distal margin and basal spines; basal spine on 8th joint about same length as 9th joint; 9th joint with lateral spine about same length as spine of 8th joint; bristle of 2nd joint reaching past 9th joint, with proximal stout spines along ventral margin and longer slender spines distally along both ventral and dorsal margins; bristles of joints 3–8 with proximal spines along ventral margin and natatory hairs distally along both margins; 9th joint with 3 bristles (1 short with short marginal spines, 1 medium and 1 long, both with natatory hairs); short bristle of 9th joint dorsal to others.

Mandible (Figure 11*g*): Coxale endite broke off specimen examined. Basale: endite with 4 pectinate terminal bristles, 1 dwarf bristle and glandular peg, and 3 triaenid bristles, each with 4 pairs of marginal spines excluding terminal pair; ventral margin near endite with 1 triaenid bristle with 3–4 marginal spines excluding terminal pair; dorsal margin with 2 slender bristles with short marginal spines; lateral and medial surfaces without spines. Exopodite about 65 percent of length of dorsal margin of 1st endopodite joint, hirsute, with 2 short bristles at tip. Endopodite: 1st joint with 3 long ventral bristles (1 of these missing on left limb of USNM 144007); dorsal margin of 2nd joint with stout spinous a-, b-, c-, and d-bristles, and 1 short proximal bristle with short marginal spines; ventral margin with 3 spinous terminal bristles; medial surface with few minute spines forming rows, 1 short cleaning bristle just distal to base of b-bristle, 4 cleaning bristles forming row just proximal to base of c-bristle, and 1 long, slender, spinous bristle medial and just proximal to base of d-bristle; lateral surface with medium slender bristle between b- and c-bristles and 1 long stout bristle between c- and d-bristles (the latter bristle missing on left limb of USNM 144007, but hole present indicating that it had been torn out); lateral bristle between b- and c-bristles shorter than c-bristle; lateral bristle between c- and d-bristles longer than c-bristle; end joint with stout dorsal claw, 4 long, stout, spinous bristles, and 1 short spinous bristle (the latter on medial side near middle of terminal margin).

FIGURE 11.—*Parasterope pollex* Kornicker, USNM 144007, adult female, length 1.45 mm: *a*, lateral view of complete specimen showing outline of lateral eye, central adductor muscle attachments, and position of 8 eggs; *b*, upper lip and lateral flap, lateral view; *c*, posterodorsal margin of left valve showing infold bristles medial view; *d*, left 1st antenna, medial view; *e*, exopodite of left 2nd antenna, lateral view; *f*, endopodite of right 2nd antenna, medial view; *g*, left mandible (coxale endite not shown), lateral view; *h*, left maxilla, lateral view; *i*, comb of right 5th limb, lateral view; *j*, left 6th limb, medial view; *k*, medial eye and bellonci organ; *l*, left and right lateral eyes. USNM 152316A, adult female, length 1.38 mm: *m*, posteroventral margin showing bristles of infold (bristles of list now shown), medial view; *n*, dorsal process, anterior to right.

Maxilla (Figure 11*h*): Epipodite pointed and hirsute, reaching to middle of dorsal margin of basale; endite I with 1 short and 3 long bristles; endite II with 3 long bristles. Basale: dorsal margin with 2 short bristles (1 proximal, 1 distal), both with bases on medial side of basale; lateral side with 1 short proximal bristle; medial side hirsute; ventral margin with 1 minute bristle near middle and 1 long, spinous, terminal bristle. Endopodite: 1st joint with short anterior bristle and medium length slender beta-bristle; end joint with 1 spinous bristle, longer and stouter than beta-bristle.

Fifth Limb (Figure 11*i*): Epipodial appendage with 52 bristles. Exopodial bristle of comb spinous, extending past end of comb; 1 short slender bristle ventral to base of comb; 2 pairs of short bristles present near ventral margin of comb.

Sixth Limb (Figure 11*j*): 1 minute medial bristle present in anterior proximal corner; anterior margin with 1 upper and 1 lower bristle; anterior corner of ventral margin with 2 plumose bristles; lateral sole without bristles; posteroventral margin with 11–13 bristles with long marginal hairs; limb hirsute.

Seventh Limb: Each limb with 12 bristles (6 proximal, 6 distal), each with 2–4 bells; terminus with opposing combs, each with 9–10 pinnate teeth.

Furca: Each lamella with 6 curved claws followed by 3 spinous bristles; main claws with slender hairs along distal half of convex margin; ventral margins with teeth forming lateral and medial row; about 10 minute teeth between longer teeth.

Bellonci Organ (Figure 11*k*): Elongate with rounded tip.

Eyes: Medial eye pigmented, with dorsal hairs (Figure 11*k*); lateral eye about ½ diameter of medial eye, with about 5 ommatidia (Figure 11*l*).

Lips (Figure 11*b*): Upper lip hirsute, consisting of 2 lobes, each with large anterior spine; saddle between lobes with minute anterior spine; lateral flap on each side of mouth hirsute.

Dorsum (Figure 11*n*): Dorsal process finger-like, hirsute.

Genitalia: Consisting of oval sclerotized ring.

Eggs: USNM 144007 with 13 eggs in marsupium (Figure 11*a*); USNM 152316A, 8 eggs; USNM 152315A, 4 eggs; USNM 15671, 8 eggs; Tampa Bay specimen returned to R. Virnstein with 2 eggs; USNM 157612, 4 eggs; USNM 157613, 3 eggs; USNM 157611, 11 eggs; USNM 152850, 7 eggs; USNM 156710, 6 eggs; USNM 156709, 15 eggs; Lake Montauk specimen, 10 eggs.

SUPPLEMENTARY DESCRIPTION OF ADULT MALE (Figure 12).—Carapace with flat posterodorsal corner; dorsal margin linear or slightly concave, not convex as on female; posterior of each valve with vertical row of long hairs (Figure 12*a*). Infold not examined.

Size: USNM 144008, length 1.24 mm, height 0.62 mm, height 50 percent length. USNM 152315, 5 specimens: length 1.25 mm, height 0.65 mm, height 52 percent length; length 1.30 mm, height 0.66 mm, height 51 percent length; length 1.26 mm, height 0.67 mm, height 53 percent length; length 1.26 mm, height 0.64 mm, height 51 percent length; length 1.27 mm, height 0.66 mm, height 52 percent length. Average length (6 specimens) 1.26 mm, average height 0.65 mm, average height as percent of length 51; USNM 156712, length 1.37 mm, height 0.78 mm, height 57 percent of length; USNM 156708, length 1.51 mm, height 0.76 mm, height 53 percent of length.

First Antenna (Figure 12*b,c*): 1st and 2nd joints similar to those of female, except spines not observed on lateral surfaces. 3rd and 4th joints separated by distinct suture; combined joints longer than wide; 3rd joint with 6 spinous dorsal bristles and 1 minute ventral bristle; 4th joint with 1 spinous dorsal bristle and 2 slender, short, ventral bristles. Stout sensory bristle of short 5th joint with 6 terminal filaments and numerous marginal filaments. Dorsal margin of 6th joint slightly undulate (undulations larger on right limb), with spinous medial bristle reaching past distal end of a-bristle of 7th joint. 7th joint: terminal margin with 12 short spines forming medial row near middle; a-bristle short claw-like with faint teeth along ventral convex margin; b-bristle about 3-times length of a-bristle, with 5 filaments including stem; c-bristle very long and stout, with 20 short marginal filaments. 8th joint: d-bristle absent; e-bristle bare, shorter than b-bristle; f-bristle very long and stout, tip broken off, 18 short marginal filaments on remaining part; g-bristle longer than b-bristle, with 9 short filaments including stem (all filaments not shown).

Second Antenna. Exopodite: 1st joint with long hairs forming 3 clusters on lateral side of terminal margin; 2nd joint with short hairs forming 2 short rows on lateral side near middle of ventral margin, longer hairs along distal margin, and minute spines forming lateral row near base of natatory bristle; terminal margin of joints 3–8 with long hairs forming row, and on lateral

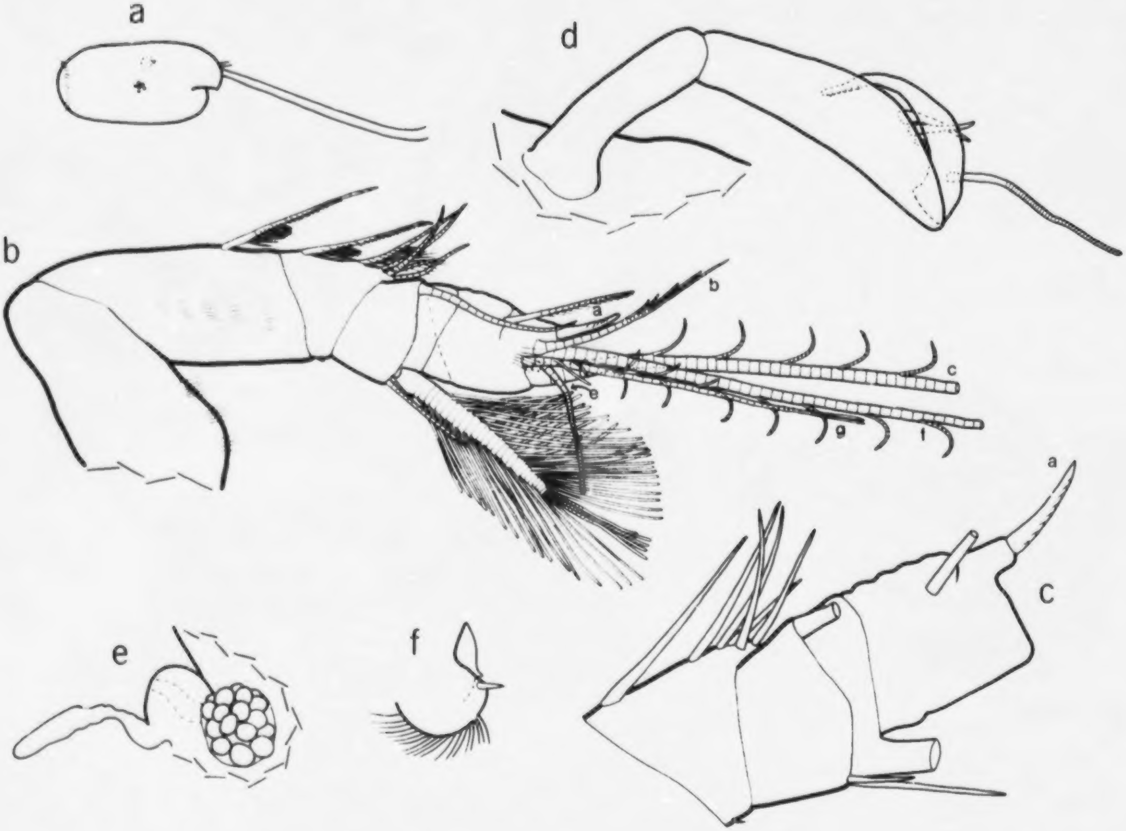


FIGURE 12.—*Parasterope pollex* Kornicker, USNM 144008, adult male, length 1.24 mm: *a*, lateral view of complete specimen showing outline of lateral eye, central adductor muscle attachments, and c- and f-bristles of 1st antenna; *b*, left 1st antenna, medial view; *c*, detail from *b*; *d*, endopodite of left 2nd antenna, medial view; *e*, left lateral eye, medial eye and bellonci organ; *f*, lateral view of upper lip.

side about 6 minute spines forming row near base of natatory bristle. Endopodite (Figure 12*d*): 3-jointed, with 3 small distal bristles on 2nd joint and 1 long proximal bristle on 3rd joint; 3rd joint reflexed on 2nd.

Mandible: Coxale endite broken off specimen examined. Basale endite similar to that of female except with only 1 or 2 triaenid bristles with 3–4 pairs of marginal spines excluding terminal pair; basale, exopodite, and 1st endopodial joints similar to those on female; 2nd endopodial joint with 2 proximal bristles on dorsal margin, 2 short cleaning bristles just distal to base of b-bristle, and long hairs and spines forming short rows on medial surface, otherwise similar to that of female; end joint similar to that of female.

Bellonci Organ (Figure 12*e*): Elongate with rounded tip.

Eyes: Lateral eye with about 17 ommatidia (Figure 12*d*). Medial eye about the same size as lateral eye, bare (Figure 12*e*).

Upper Lip (Figure 12*f*): Hirsute with anterior spine.

SUPPLEMENTARY DESCRIPTION OF UNDEVEL-

OPED Male.—Kornicker (in Bowman and Kornicker, 1967:16) described 3 males that had numerous filaments on the sensory bristle of the 1st antenna, but on which the endopodite of the 2nd antenna was equivalent to the A-1 male instar. One of the specimens assigned USNM 152447 was similarly developed. Size: length 1.63 mm, height 0.84 mm.

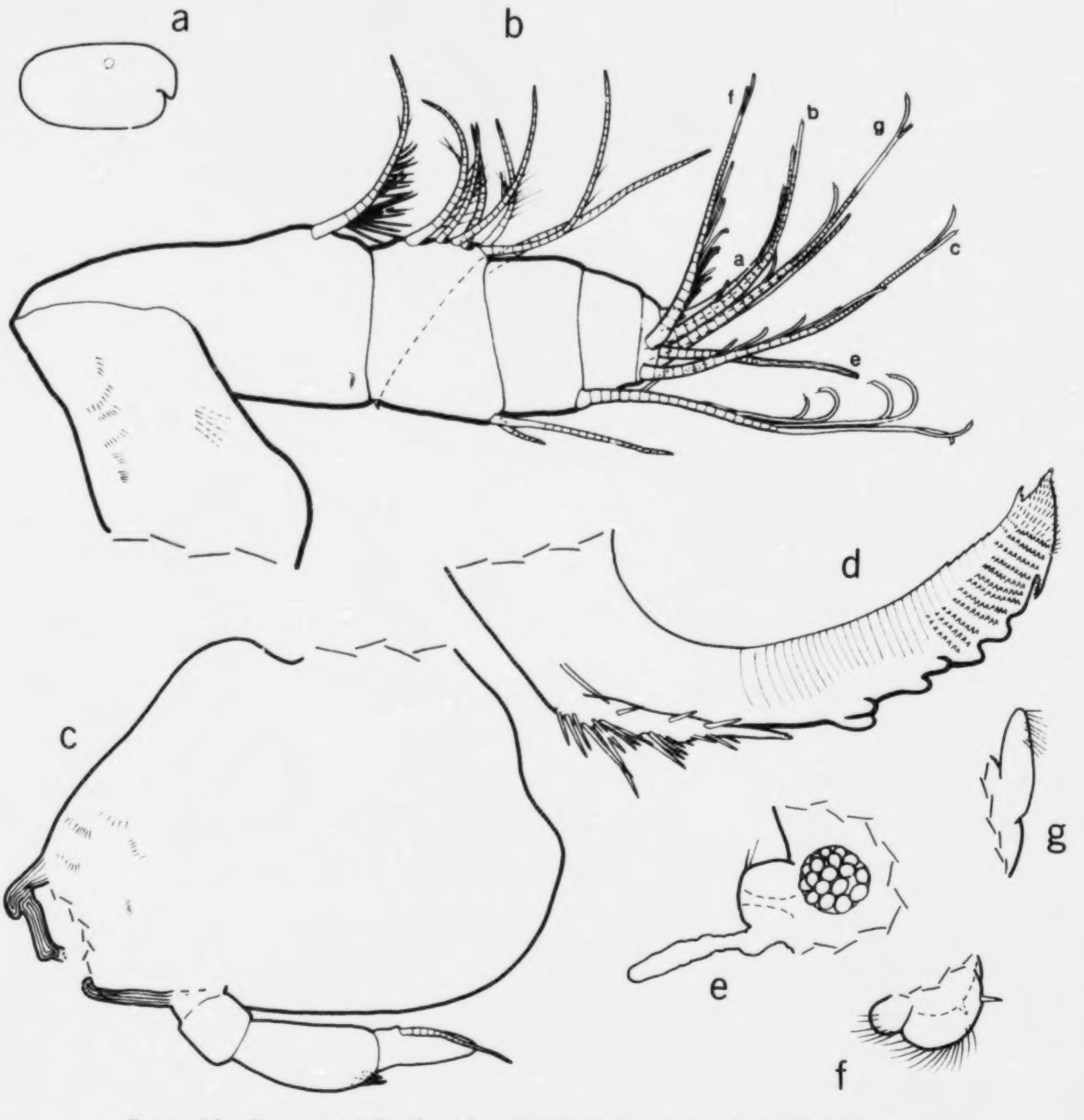


FIGURE 13.—*Parasterope pollex* Kornicker, USNM 152318, A-1 male, length 1.10 mm: *a*, complete specimen showing outline of lateral eye; *b*, right 1st antenna, lateral view; *c*, protopodite and endopodite of right 2nd antenna, medial view; *d*, coxale endite of right mandible, medial view; *e*, left lateral eye, medial eye and bellonci organ; *f*, upper lip and lateral flap, from right; *g*, dorsum.

Supplementary Description of A-1 Male (Figure 13).—Carapace similar in shape to that of adult female (Figure 13*a*).

Size: USNM 152318, length 1.10 mm, height 0.56 mm.

First Antenna (Figure 13*b*): 1st and 2nd joints similar to those of adult female except very few lateral spines observed on 2nd joint, 3rd and 4th joints fused on medial side, but separated by suture on lateral side; combined joints shorter than wide; 3rd joint with 6 spinous dorsal bristles and 1 minute ventral bristle; distal margin of 4th joint only slightly concave, otherwise similar to that of adult female. Sensory bristle of 5th joint with 1 short proximal and 6 long distal filaments. 7th joint similar to that of adult female except c-bristle with 11 filaments including stem. 8th joint similar to that of adult female except f-bristle with 12 filaments including tip.

Second Antenna (Figure 13*c*): Protopodite with short spines forming rows on medial side near dorsal margin. Exopodite similar to that of female except lateral spine of 8th joint consisting of 2 prongs, each about half length of 9th joint.

Mandible: Coxale endite with both terminal and distal dorsal bristles broken off on specimen examined; tip of ventral branch with 3–4 fine spines. Basale endite with 1 triaenid bristle with 3–4 pairs of marginal spines excluding terminal pair, endite otherwise similar to that of adult female. Basale: triaenid bristle with only 2 pairs of marginal spines excluding terminal pair, otherwise similar to that of adult female. Exopodite and endopodite similar to those of adult female, except no medial spines observed on 2nd endopodial joint.

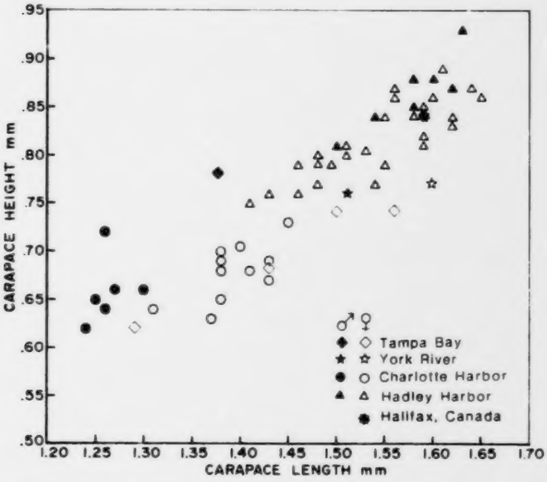


Figure 14.—Relation between carapace length and height of adult males and females of *Parasterope pollex* from different locations along the eastern and Gulf coasts of North America.

Maxilla, Comb of Fifth Limb, Seventh Limb, Bellonci Organ (Figure 13*e*), *Upper Lip* (Figure 13*f*), *Dorsum* (Figure 13*g*): Similar to those of female.

Sixth Limb: Similar to that of adult female except with only 9 or 10 posteroventral bristles.

Furca: Each lamella with 6 claws followed by 2 bristles.

Eyes: Lateral eye smaller than eye of adult male but with about same number of ommatidia (Figure 13*e*). Medial eye with few hairs (Figure 13*e*).

Copulatory Organ: Present but poorly developed.

Ontogeny and Sexual Dimorphism.—The number of bristles on the dorsal margin of the 3rd joint of the 1st antenna is 6 for the A-1 male and adult male, but only 5 on the adult female. The sensory bristle of the 5th joint of the 1st antenna of the A-1 male bears a short proximal filament. This is absent on the adult female and probably also on the A-1 female, but the latter has not been examined. C-bristle of 7th joint and f-bristle of 1st antenna of A-1 male with more filaments than on adult female but less than on adult male. Exopodial joints of 2nd antenna with long hairs on adult male but not on A-1 male and adult female. Endopodite of 2nd antennae with usual dimorphism. Adult male with 2 proximal bristles on dorsal margin of 2nd endopodial joint of mandible; A-1 male and adult female with only 1 bristle in this location.

Geographic Variability in Carapace Size.—Carapaces of specimens from the Gulf of Mexico are generally shorter and narrower than those from the west Atlantic (Figures 14, 15). Also, adult males from the Gulf of Mexico are smaller than adult females from that area;

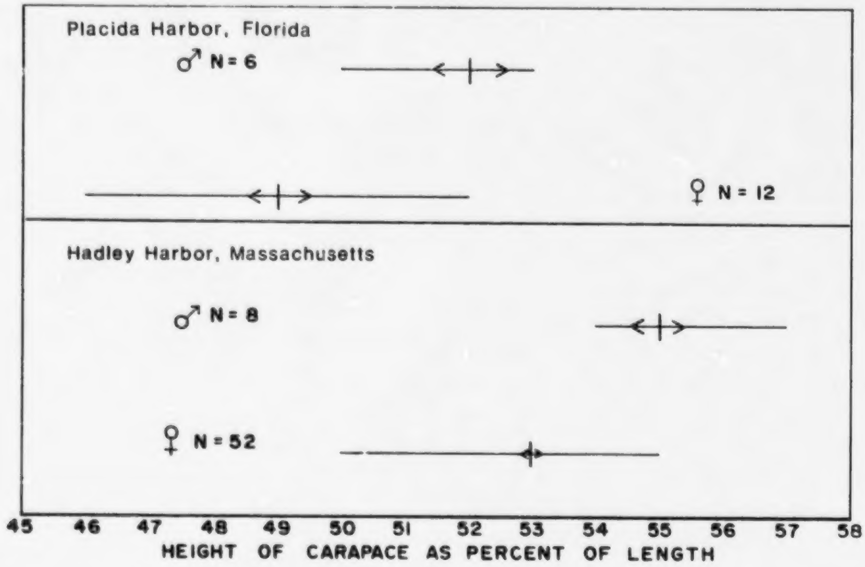


FIGURE 15.—Relative height of carapace as percent of length of adult males and females of *Parasterope pollex* from Florida (Gulf of Mexico) and Massachusetts. (Range, mean, and 1 standard deviation.)

whereas, adult males and females from the western Atlantic are roughly the same size (Figure 14). Initially this was thought to indicate that 2 subspecies live in the study area. Then, both large and small forms were collected in Tampa Bay suggesting that they are not subspecies. I have found it expedient to refer both the large and small forms to *P. pollex*. The appendages of the western Atlantic form and those of the Gulf of Mexico form are quite similar (the supplementary description of appendages presented herein is based on specimens from the Gulf of Mexico).

***Parasterope hulingsi* Baker, 1978**

FIGURES 16, 17

Cylindroleberis psitticina Darby, 1965:317[part], pl. 19: fig. 5, pl. 20: figs. 3, 4, 6, 7, 9.
Parasterope species.—Kornicker, 1974a:19.
Parasterope hulingsi Baker, 1978:145, figs. 3, 4.

HOLOTYPE.—AHF 5744, adult female.

TYPE-LOCALITY.—Station 4867, south of San Mateo Point, California, 33°17′35″N, 117°28′50″W; bottom depth 13.7 m.

MATERIAL.—Appendages of Holotype; A-1 male paratype, USNM 151400A. Off North Carolina, R/V *Easton* cruise 1: USNM 158570, 1 adult female, sta 157-1; USNM 158601, 1 ovigerous female from same station; USNM 158571, 1 adult male, sta 230-1. Off Sapelo Island, Georgia: A-1 male, UMMP 48802 [paratype of *Cylindroleberis psitticina* Darby, 1965: 31].

DISTRIBUTION.—Continental shelf of Southern California at depths of 4.3–401.4 m (Baker, 1978:146); North Carolina, at depths of 31–32 m; Georgia, at unspecified depth but between 13.7 and 123 m (Darby, 1965:33).

DISCUSSION.—*Parasterope hulingsi* is unusual in that the 1st endopodial joint of the maxilla is without bristles. No other species in the subfamily Cylindroleberidinae lacks both bristles on that joint. Both the adult female and male collected in the Atlantic apparently differed from the specimens described by Baker (1978:148) in having a minute, faint, spine-like bristle at the upper suture and no bristle at the lower suture of the anterior margin of the 6th limb, compared to a short, well-defined bristle at both sutures (see Baker, 1978, fig. 3j). When a paratype (an A-1 male) that Baker had deposited at the NMNH was examined and found to have a 6th limb similar to the Atlantic specimens, I sent to California for the appendage slide of the adult female holotype. I could find no anterior bristles on the single available 6th limb. I conclude, therefore, that the 2 bristles shown in Baker's illustration of the 6th limb are sutures, not bristles. The length of the holotype given by Baker is 1.46 mm, which is larger than the two Atlantic females (length 1.30 mm, 1.31 mm). The adult male described by Baker is about the same length as the adult Atlantic male.

SUPPLEMENTARY DESCRIPTION OF HOLOTYPE, ADULT FEMALE (Figure 16*a*).—*First Antenna:* Distal margin of 4th joint deeply concave on both medial and lateral sides (Figure 16*a*); d-bristle of 8th joint represented by minute peg.

Maxilla: Endite I with 1 small bristle in addition to 3 large bristles.

Sixth Limb: Only left limb examined. No bristles observed on anterior margin; 2 small bristles on ventral margin of anteroventral corner.

REMARKS.—When the holotype slide, on which the appendages had been mounted in glycerine, was received from California, many of the appendages apparently had drifted to the edge, and were covered by the ringing compound. While remounting the specimen the slide was dropped by an assistant and, unfortunately, only the 1st antennae, a maxilla and a 6th limb were recovered.

DESCRIPTION OF ADULT FEMALE FROM THE ATLANTIC (Figure 16*b–j*).—Carapace elongate with sloping posterodorsal margin and evenly rounded posteroventral margin; incisur well below valve middle; carapace surface smooth (Figure 16*b*).

Infold: Rostral infold with about 45 short bristles dorsal to list, about 6 bristles on list, and about 10 bristles ventral to list; anteroventral infold with about 27 bristles; ventral infold with about 26 bristles forming row (posterior bristle opposite anterior end of broad posteroventral list bearing flap-like bristles). Narrow list with anterior end at inner end of incisur continuing along ventral margin, then broadening along posteroventral and posterior margin, where it bears flap-like bristles; broad list with about 17 flap-like bristles and about 12 short slender bristles (Figure 16*c*); infold between broad list and posterior edge of valve with 5 scoop-like processes and numerous minute bristles; infolds of left and right valves similar.

Selvage: Wide lamellar prolongation with marginal fringe present along ventral margin of incisur.

Size: USNM 158570, length 1.31 mm, height 0.61 mm; USNM 158601, length 1.30 mm, height 0.62 mm.

First Antenna (Figure 16*d*): 1st joint with many hairs on medial surface, and fewer hairs on distal lateral surface. 2nd joint with spines forming rows on ventral margin and on both medial and lateral surfaces near ventral margin (more abundant on medial side); dorsal margin with few short spines and 1 long spinous bristle; lateral side with distal bristle with faint marginal spines. 3rd joint short; short ventral margin with minute bristle; longer dorsal margin with 5 bristles (4 with long marginal spines, 1 with few, short, marginal spines), medial side of joint with few lateral spines near base of ventral bristle. 4th joint with deeply concave distal margin; short dorsal margin with 1 long bristle with short marginal spines; longer ventral margin with spines forming rows, and 2 slender terminal bristles. Sensory bristle of long 5th joint with 6 terminal filaments. 6th joint minute, fused with 5th joint, with long, spinous, medial bristle. 7th joint: a-claw finely pectinate along middle of dorsal margin; b-bristle about one-third longer than a-claw, with 3 long proximal filaments and bifurcate tip; c-bristle only slightly longer than b-bristle, with 6 marginal filaments excluding tip of stem. 8th joint: d-bristle a minute peg; e-bristle slightly shorter than a-claw, bare with blunt tip. f-bristle about same length as c-bristle, oriented dorsally, with 4 marginal filaments excluding stem; g-bristle about same length as c-bristle, with 5 marginal filaments excluding stem. Minute terminal spine on filaments of sensory bristle of 5th

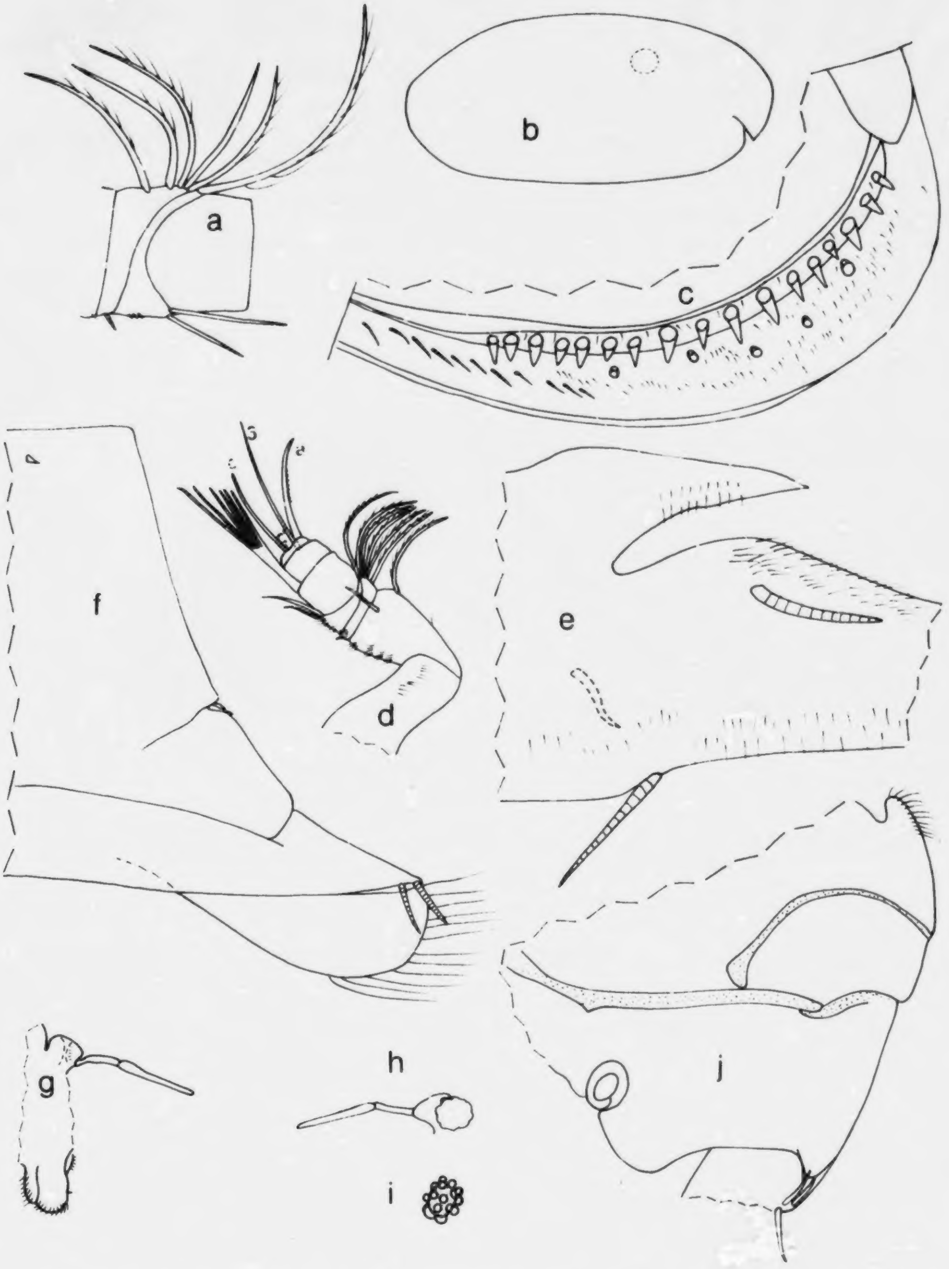


FIGURE 16.—*Parasterope hulingsi* Baker, AHF 5744, holotype, adult female: *a*, joints 3–5 of 1st antenna. USNM 158570, adult female, length 1.30 mm: *b*, lateral view of complete specimen showing outline of lateral eye; *c*, medial view of posterior of right valve; *d*, left 1st antenna, lateral view; *e*, part of left maxilla, medial view; *f*, anterior part of left 6th limb, medial view (most hairs left off); *g*, anterior of body showing medial eye, bellonci organ, and upper lip with lateral flap, anterior to right; *h*, left lateral eye (ommatidia not shown), medial eye and bellonci organ; *i*, right lateral eye; *j*, posterior of body showing dorsum, Y-sclerite and girdle, left genitalia, and 3 posterior furcal claws.

joint, and on filaments and stem of b-, c-, f-, and g-bristles.

Second Antenna: Protopodite: dorsal margin and dorsal half of medial surface spinous; with small distal medial bristle. Endopodite relatively short, 3-jointed, but with suture between joints 2 and 3 weakly developed; terminal bristle reaching distal end of 7th exopodial joint. Exopodite: 1st joint with distal hairs forming rows along dorsal margin; bristle of 2nd joint reaching 9th joint, with slender ventral spines; bristles of joints 3–8 with slender ventral spines and natatory hairs (spines of bristle of 3rd joint stouter than others); 9th joint with 3 bristles (longest of these with faint ventral spines and natatory hairs; shortest bristle with short marginal spines; middle bristle with natatory hairs); distal margins of joints 3–9 with lateral spines forming row (lateral spines of 9th joint fused at base, fan-like).

Mandible: Coxale endite: no bristle observed at base of ventral branch; ventral branch with spines forming 3 or 4 oblique rows; tip of branch with several spines; dorsal branch broken off both limbs. Coxale with medial side hirsute. Basale endite with 4 end-type bristles, 2 triaenid bristles, 2 dwarf bristles, and small glandular peg. Basale: dorsal margin with fairly long midbristle and 2 terminal bristles (longer of these reaching middle of dorsal margin of 2nd endopodial joint, other half this length and slightly longer than midbristle); ventral margin with U-shaped sclerotized internal process but no bristles; medial surface bare, lateral surface with spines forming rows near dorsal margin. Exopodite reaching just past middle of dorsal margin of 1st endopodial joint, hirsute distally and with 2 small subterminal bristles. 1st endopodial joint with 3 ventral bristles (2 long with long spines, 1 medium with short spines). 2nd endopodial joint: ventral margin with 3 long terminal bristles with short marginal spines; dorsal margin with short proximal bristle and pectinate and spinous a-, b-, c-, and d-bristles; medial side with 3 or 4 stout spines at base of short proximal bristle, 1 cleaning bristle just distal to base of b-bristle, 4 cleaning bristles forming oblique row just proximal to base of c-bristle, 1 long spinous bristle just distal to base of d-bristle and, faint spines forming rows; lateral side with slender spinous bristles between b- and c-bristles (bristle about three-fourths length of b-bristle), and 1 very long spinous bristle between c- and d-bristles. End joint with stout, fairly straight, dorsal claw with teeth along ventral edge. Four long, stout, spinous bristles, and 1 short, slender, spinous, medial bristle.

Maxilla (Figure 16*e*): Epipodial appendage about ⅓ length of dorsal margin of basale, with long hairs distally. Endite I with 3 long and 1 short bristle; endite II with 3 long bristles. Basale: dorsal margin and medial surface hirsute; medial side with 1 proximal bristle near dorsal margin; lateral side with 1 short proximal bristle near middle; ventral margin with 1 backward-pointing proximal bristle and 1 long, spinous, terminal bristle. Endopodite: 1st joint without bristles; 2nd joint with 1 long bristle reaching past tip of terminal bristle on ventral margin of basale.

Fifth Limb: Comb with stout, spinous, exopodial bristle reaching past distal end of comb; 1 small slender bristle present just ventral to base of stout bristle; 2 pairs of bristles present near ventral margin just anterior to base of stout exopodial bristle; 2 lateral bristles, with bases near ventral margin, present near distal end of comb; 1 short lateral bristle with base near ventral margin present near proximal end of comb; ventral margin of comb with 28 spinous bristles (distal 4 bristles slightly longer than others); dorsal half of margin of distal end of comb hirsute.

Sixth Limb (Figure 16*f*): Medial side with faint minute spine in anterodorsal corner set back some distance from anterior margin; anterior margin with well-developed upper and lower sutures representing endites (upper suture with minute spine-like bristle; lower suture bare); 2 ventral bristles present at anterior corner of skirt; lateral flap with hairs but not bristles; ventral and posteroventral margin of skirt with hairs but no bristles; posterior end of skirt broad, hirsute, without bristles. Note: minute bristle at upper anterior suture not readily visible except at high magnification (× 100 objective).

Seventh Limb: Proximal group with 4 bristles (3 on 1 side, 1 on other), each bristle with 2–4 bells; distal group with 6 bristles (3 on each side, each bristle with 2–4 bells). Terminus with opposing combs, each with 6 or 7 spinous teeth.

Furca (Figure 16*j*): Each lamella with 9 claws; all claws separated from lamella by suture; all claws except posterior 2 with teeth along posterior margins; claws 1–3 with few long teeth separated from each other by 6 or 7 smaller teeth; claws 1 and 2 with distal spines along anterior margins; posterior 1 or 2 claws oriented posteriorly, or posterodorsally.

Bellonci Organ (Figure 16*g,h*): Cylindrical proximally, broadening near middle, then narrowing to rounded tip.

Eyes: Medial eye bare, unpigmented (Figure 16*g,h*). Lateral eye about same size as medial eye, with black pigment and 15 ommatidia (Figure 16*b,h,i*).

Upper Lip (Figure 16*g*): Consisting of 2 hirsute lobes with faint anterior spines; hirsute lateral lobes on each side of mouth.

Genitalia (Figure 16*j*): Consisting of oval sclerotized ring on each side of body anterior to furca.

Posterior of Body (Figure 16*j*): With small thumb-like process bearing spines.

Y-Sclerite (Figure 16*j*): Typical for subfamily.

Gill-like Structures: 7 well-developed gills on each side of posterodorsal end of body.

Eggs: USNM 158601 with 5 eggs in marsupium.

DESCRIPTION OF ADULT MALE FROM THE ATLANTIC (Figure 17*a–f*).—Carapace elongate with dorsal margin much higher near anterior (Figure 17*a*); hairs forming vertical row near posterior end; ovoid adductor muscle attachments anterior to middle.

Infold: Not examined.

Size: USNM 158571, length 1.62 mm, height 0.77 mm.

First Antenna: 1st joint bare. 2nd joint with spines forming rows near ventral margin, 1 distal lateral bristle, 1 spinous, distal, dorsal bristle, and few ventral spines. 3rd joint with 1 small bristle on short ventral margin, and 7 spinous bristles on longer dorsal margin. 4th joint with 2 short, bare, ventral bristles and 1 long, bare, dorsal bristle. Sensory bristle of short 5th limb stout, with abundant filaments. Fairly long 6th joint with long ventral bristle near dorsal margin. 7th joint: a-claw fairly short, with base on short pedestal, and minute distal teeth on ventral margin; b-bristle about 3 times length of a-claw, with about 5 marginal filaments; c-bristle extremely long, with 19 dorsal, marginal filaments. 8th joint: d-bristle absent; e-bristle about 2½ times length of a-claw, bare with blunt tip; f-bristle same length as c-bristle, with 19 ventral, marginal filaments; g-bristle longer than b-bristle, with 8 marginal filaments. No processes present on dorsal margins of joints 5 or 6. Suture between 4th and 5th joints not deeply concave as on female and juveniles.

Second Antenna: Protopodite with small, distal, medial bristle, otherwise bare. Endopodite with 3 closely spaced bristles on ventral margin of elongate 2nd joint, and 1 long, proximal, dorsal bristle on reflexed 3rd joint. Exopodite: long 1st joint with long distal hairs forming lateral row; joints 2–8 with short spines and long ventral hairs along distal margins; 2nd joint about 2½ times length of 3rd joint; 9th joint with lateral spine about ⅓ length of joint; joints 2–8 with long bristles with natatory hairs; 9th joint with 4 bristles (3 long, 1 short; all with natatory hairs).

Mandible: Coxale endite: ventral branch with spines forming 4 oblique rows, and tip with 3 minute slender teeth; ventral margin of dorsal branch with 3 pairs of low pointed processes followed by small main spine; dorsal margin with distal serrations, and bristle with base some distance from pointed tip of branch (Figure 17*b*); no bristle observed at base of ventral branch; medial side of coxale bare. Basale endite similar to that of adult female from the Atlantic. Dorsal margin of basale with smallest terminal bristle about ⅓ length of longest bristle; joint otherwise similar to that of adult female. Exopodite not quite reaching middle of dorsal margin of 1st

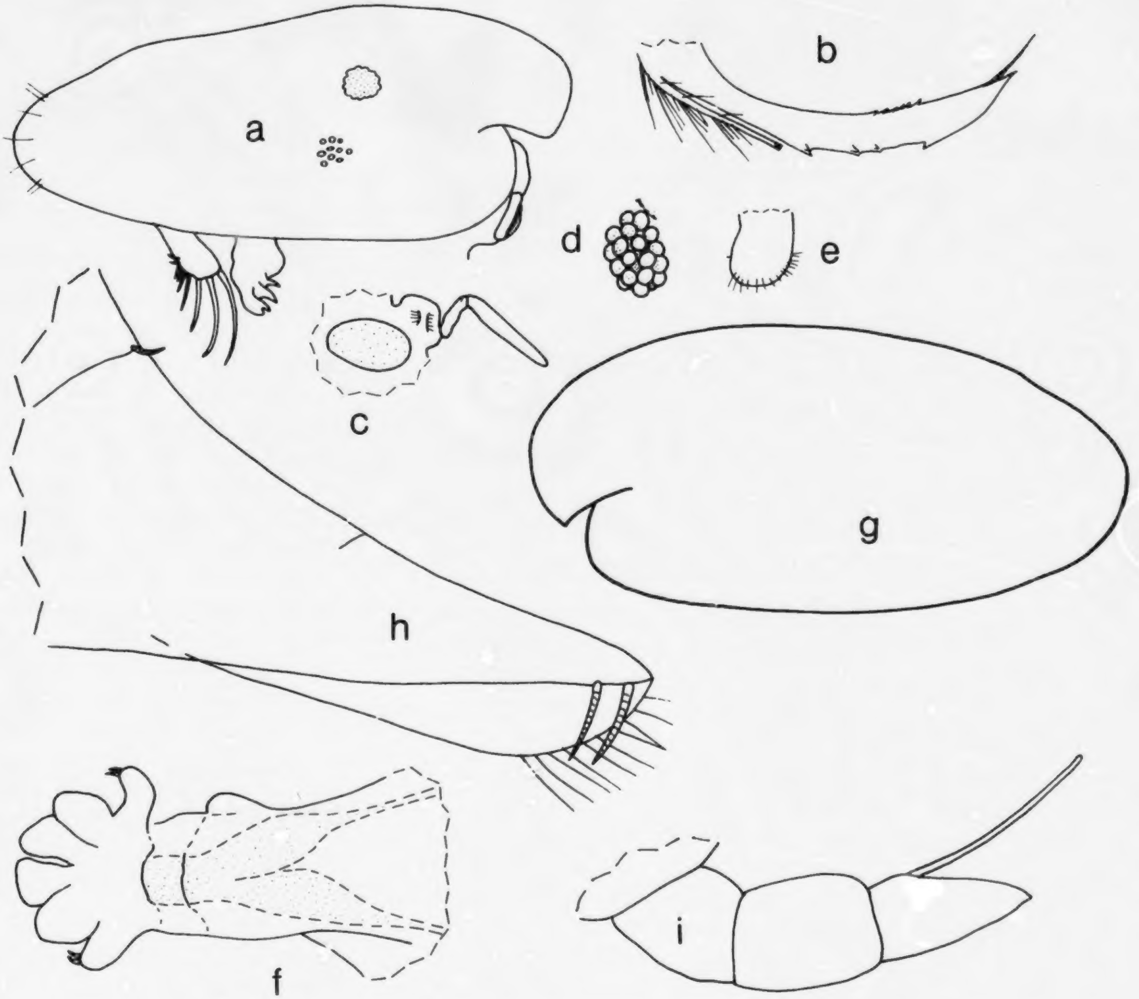


FIGURE 17.—*Parasterope hulingsi* Baker, USNM 158571, adult male, length 1.62 mm: *a*, lateral view of complete specimen showing right lateral eye, generalized central adductor muscle attachments, posterior hairs, and some appendages (endopodite of right 2nd antenna, right lamella of furca, copulatory organ); *b*, coxale endite of mandible; *c*, right lateral eye with black pigment (ommatidia not shown), medial eye and bellonci organ; *d*, lateral eye; *e*, upper lip from left; *f*, copulatory organ, anterior or posterior view. USNM 151400A, A-1 male, length 1.43 mm: *g*, lateral view of complete carapace with body removed; *h*, anterior part of left 6th limb, medial view; *i*, endopodite of right 2nd antenna, medial view.

endopodial joint, hirsute, with 2 small subterminal bristles. Ventral margin of 1st endopodial joint with 3 bristles (2 long with long marginal spines, 1 medium with long and short marginal spines). 2nd endopodial joint with 3 short proximal bristles, otherwise similar to that of adult female. End joint similar to that of adult female.

Maxilla, Fifth, Sixth, and Seventh Limbs, Furca, and Bellonci Organ: Similar to those of adult female from the Atlantic, except anterior furcal claws more slender and longer.

Eyes: Medial eye unpigmented, bare (Figure 17*c*). Lateral eye larger than medial eye, with black pigment and 18 ommatidia. (Figure 17*c,d*).

Upper Lip (Figure 17*e*): Similar to that of adult female from the Atlantic.

Copulatory Organ (Figure 17*f*): Each copulatory organ consisting of 3 lobes, outer of these with 2 small bristles.

Description of A-1 Male Paratype (Figure 17*g–i*).—Shape of carapace similar to that of adult female (Figure 17*g*).

Infold: Posterior infold with 4–5 processes between list and posterior margin.

Size: USNM 151400A, length 1.43 mm, height 0.69 mm.

First Antenna (not examined in detail): 1st, 2nd, 4th, 5th, and 6th joints similar to those of adult female. 3rd joint with 6 dorsal bristles and 1 minute ventral bristle. 7th joint: c-bristle with about 13 short marginal filaments. 8th joint: d-bristle represented by minute peg; e-bristle about same length as a-claw; f-bristle with about 8 marginal filaments.

Second Antenna: Protopodite and exopodite similar to that of adult female from the Atlantic except 9th joint with 4 bristles (2 long, 1 medium, 1 short; all except last 2 with natatory hairs). Endopodite 3-jointed (Figure 17*i*): 1st and 2nd joints bare; 3rd joint with long, proximal, dorsal bristle and minute, pointed, terminal process.

Mandible: Not examined in detail but, in general, similar to that of adult female.

Maxilla: Similar to that of adult female from the Atlantic.

Sixth Limb (Figure 17*h*): Similar to that of adult female from the Atlantic.

Seventh Limb: Differs from adult female in having only 4 distal bristles (2 on each side); each bristle fairly cylindrical and with 2 or 3 bells.

Furca: Each lamella with 8 claws; posterior claw oriented posteriorly.

Bellonci Organ: Similar to that of adult female.

Lateral Eye: Pigmented dark brown, with about 18 ommatidia.

Y-Sclerite and Gill-like Structures: Similar to those of adult female.

Remarks.—This specimen was believed to be an adult female by Baker (1978:145); when I opened the carapace I found it to be an A-1 male. The A-1 male differs from the adult female in having 6 instead of 5 bristles on the dorsal margin of the 3rd joint of the 1st antenna, in having 4 instead of 3 bristles on the 9th exopodial joint of the 2nd antenna, and in other characters. The sensory bristle of the 5th joint of the 1st antenna does not bear a short proximal filament present on juvenile males of some species of *Parasterope*. The second "female" paratype deposited at NMNH by Baker is also an A-1 male.

Supplementary Description of A-1 Male from the Atlantic.—Carapace similar in shape to that of A-1 male paratype in having sloping posterodorsal margin.

Size: UMMP 48802, length 1.29 mm, height 0.59 mm (Darby, 1965:32). (The specimen is smaller than the A-1 male paratype, USNM 151400A, length 1.43 mm.)

First Antenna: Similar to A-1 male paratype, except dorsal margin of 3rd joint with only 5 bristles on right limb, 6 on left.

Second Antenna (see Darby, 1965, pl. 19: fig. 5, pl. 20: fig.9): Similar to A-1 male paratype.

Mandible: Coxale with medial side hirsute; endite missing on both limbs. Basale, exopodite, 1st and 3rd endopodial joints, similar to those of adult female. 2nd endopodial joint differs from that of female from the Atlantic in having 2 proximal bristles on dorsal margin (female described by Baker, 1978:148 has 2 proximal bristles), and in having 4 slender medial spines forming row between a- and b-bristles.

Maxilla (see Darby, 1965, pl. 20: fig. 3): Similar to that of adult female from the Atlantic, and to A-1 male paratype.

Fifth Limb (see Darby, 1965, pl. 20: fig. 6): Similar to that of adult female from the Atlantic.

Sixth Limb: Missing.

Seventh Limb: Differs from A-1 male paratype in having 6 distal bristles (similar to adult female in this character). Proximal group on both limbs consisting of 4 bristles (3 on one side, 1 on other; this observation differs from that of Darby, 1965:32; I can only assume that Darby thought that 2 of the proximal bristles had broken off on the male, but I see no evidence for this on the limbs).

Furca: Each lamella with 9 claws; posterior claw oriented posteriorly. Anterior 3 or 4 claws resemble those of adult male from the Atlantic in being more slender and longer than those of female.

Bellonci Organ (see Darby, 1965, pl. 20: fig. 4): Similar to that of adult female, but may have weak suture near middle.

Eyes: Medial bare. Lateral eye well developed, pigmented, with about 22 ommatidia (see Darby, 1965, pl. 20: fig. 7).

Y-Sclerite and Gill-like Structures: Similar to those of adult female.

REMARKS.—Darby (1965:32) identified this specimen (UMMP 48802) as a paratype of *Cylindroleberis psitticini*. Unfortunately, the 6th limbs of the specimen are not available now and, also, were not seen by Darby. The absence of bristles on the 1st endopodial joint of the maxilla, the unusual distribution of the proximal bristles of the 7th limb, the presence of medial spines at the base of the proximal bristles on the dorsal margin of the 2nd endopodial joint of the mandible, and the similarity of appendages other than the important 6th limb, permits referral of the specimen to *Parasterope hulingsi*, as defined herein, with some confidence.

***Parasterope zeta*, new species**

FIGURES 18–20

ETYMOLOGY.—The specific name is from the Greek letter Zeta.

HOLOTYPE.—USNM 158238, adult female on slide and in alcohol.

TYPE-LOCALITY.—Gulf of Mexico, R/V *Gyre*, cruise 11, sta. 8.

PARATYPES.—Gulf of Mexico, R/V *Gyre*, cruise 11: USNM 158237, adult male, sta 9; USNM 158236, USNM 158361, 2 juvenile males, sta 8; USNM 158362, 7 juvenile males, sta 8.

DISTRIBUTION.—Texas continental shelf at depth of 58 m.

DESCRIPTION OF ADULT FEMALE (Figures 18, 19).—Carapace elongate with incisur well below middle of anterior margin; valve highest just posterior to valve middle; in lateral view, posterior end less broadly rounded than anterior end; surface smooth (Figure 18*a*).

Infold (Figure 18*b–d*): Infold behind rostrum with about 10 bristles on list, about 18 bristles between list and incisur, and about 50 bristles anterior and dorsal to list; 4 small bristles present at inner end of incisur (Figure 18*b*); about 38 bristles on broad anteroventral infold extending from incisur to point where bristles form single row along ventral margin; ventral margin with about 19 bristles forming single row ending posteriorly at point where list becomes broad. List beginning at inner margin of anterior part of infold near incisur, extending along ventral margin and continuing on posterior infold where it broadens; broad posterior list with 13 or 14 broad, transparent, flap-like bristles and 8–12 small bristles (not more than 2 small bristles between each pair of flap-like bristles); 8–12 bristles and 5 processes present between posterior list and posterior valve margin (Figure 18*c,d*).

Size: USNM 158238, length 1.02 mm, height 0.52 mm.

First Antenna (Figure 18*e*): 1st joint with medial and lateral spines. 2nd joint with medial and lateral spines and 2 bristles (1 dorsal, 1 lateral). 3rd and 4th joints separated by faint diagonal suture; ventral margin of 3rd joint short, with 1 small bristle; dorsal margin with 4 bristles with long spines and 1 bristle with short spines (left limb of USNM 158238 lacking bristle with short marginal spines, Figure 18*e*). 4th and 5th joints fused on lateral side but separated by concave suture on medial side; 4th joint with medial and ventral spines and 3 bristles (2 short and ventral, 1 long and dorsal). Sensory bristle of 5th joint with short, stout, proximal part and 6 terminal

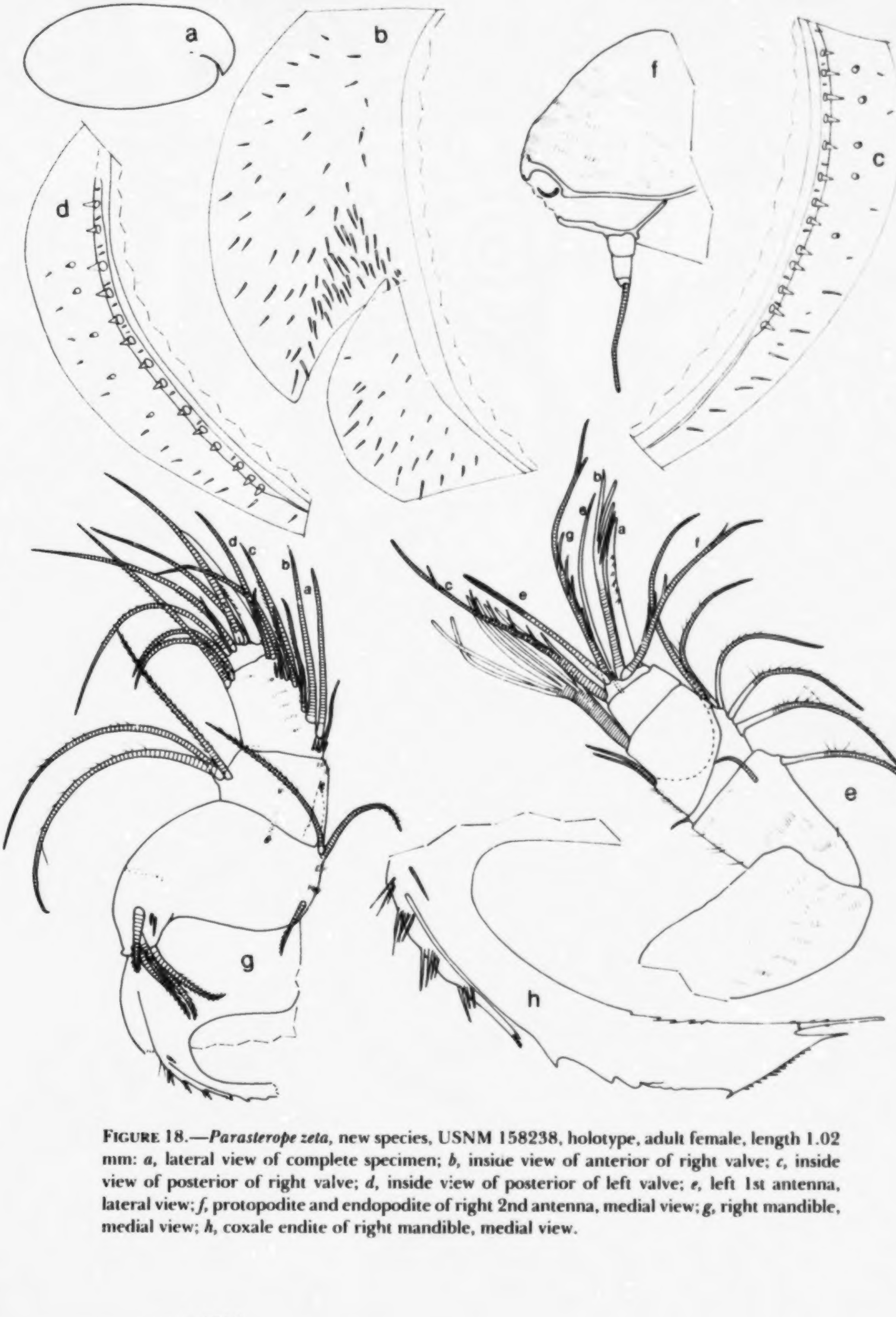


FIGURE 18.—*Parasterope zeta*, new species, USNM 158238, holotype, adult female, length 1.02 mm: *a*, lateral view of complete specimen; *b*, inside view of anterior of right valve; *c*, inside view of posterior of right valve; *d*, inside view of posterior of left valve; *e*, left 1st antenna, lateral view; *f*, protopodite and endopodite of right 2nd antenna, medial view; *g*, right mandible, medial view; *h*, coxale endite of right mandible, medial view.

filaments. Medial bristle of minute 6th joint reaching past tip of a-claw of 7th joint. 7th joint: a-claw slender, recurved, about same length as combined length of joints 3–8, with few teeth near middle; b-bristle about one-third longer than a-claw, with 4 marginal filaments; c-bristle almost twice length of a-claw, with 6 marginal filaments. 8th joint: d-bristle minute; e-bristle about same length as b-bristle, bare with blunt tip; f-bristle about same length as b-bristle, bent dorsally, with 4 marginal filaments; g-bristle slightly longer than c-bristle, with 5 marginal filaments. Sensory bristle, b-, c-, f-, and g-bristles, also their filaments with spine at tip.

Second Antenna (Figure 18*f*): Protopodite with medial spines forming rows on dorsal half, and with 1 short distal bristle. Endopodite: 1st joint short, bare; 2nd joint short, separated from 3rd joint by faint suture; small 3rd joint with long terminal bristle. Exopodite: elongate 1st joint bare; bristle of 2nd joint reaching 8th joint, with long spine-like hairs along proximal half; bristles of joints 3–8 long, with natatory hairs; 9th joint with 3 bristles (1 long with natatory hairs, 2 short, bare); 9th joint with small lateral spine; joints 2–8 with minute spines along distal margin.

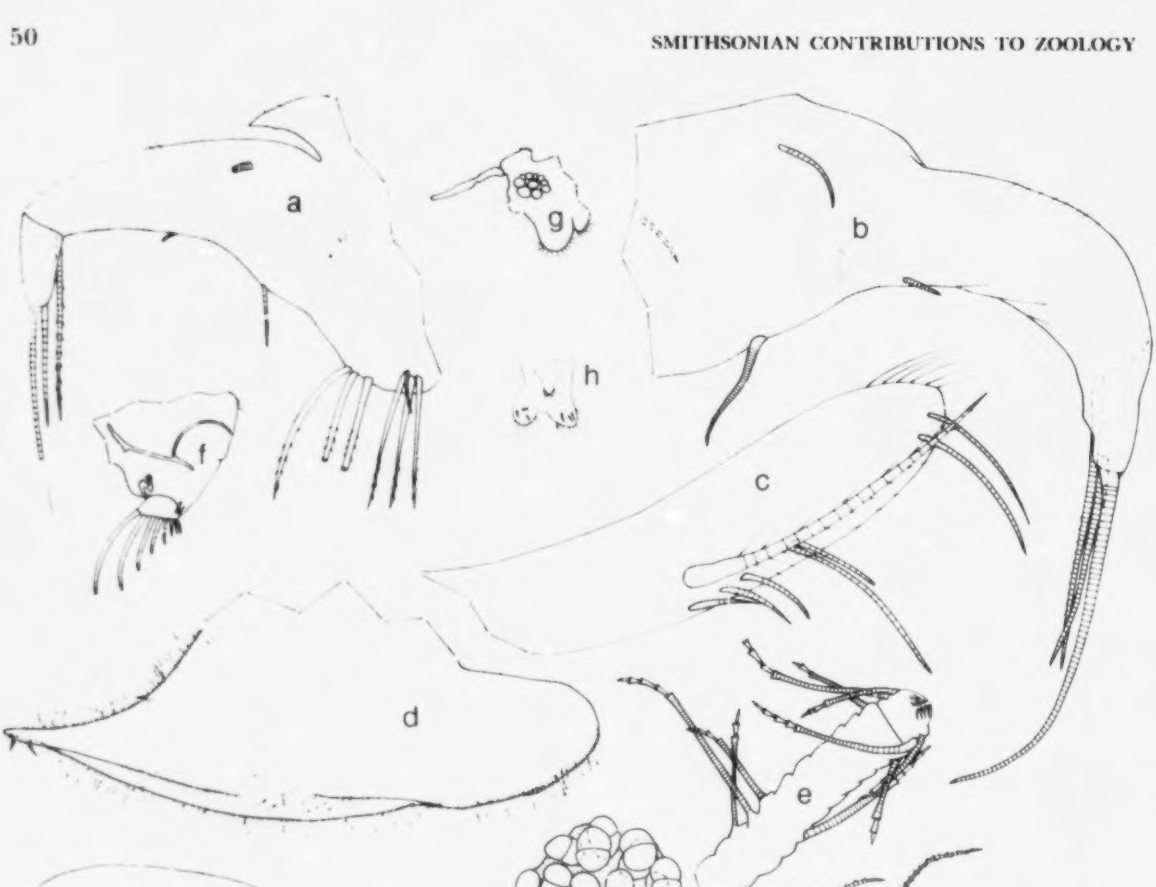
Mandible (Figure 18*g,h*): Coxale endite with small bristle near base of ventral branch; ventral branch with spines forming 4 rows (proximal row hair-like), and slender tip with 2 spines; ventral margin of dorsal branch with 2 or 3 paired teeth followed by undulate margin and small main spine; dorsal margin with hirsute bristle with base set back from tip of branch. Basale endite with 3 or 4 end bristles, 2 triaenid bristles, and 2 dwarf bristles; dorsal margin of basale with 1 short, backward-pointing midbristle and 2 terminal bristles; lateral surface of basale with spines forming rows on dorsal half, some spines also on dorsal margin and medial surface. (U-shaped depression generally present along ventral margin on basale in other species, slit-like on USNM 158238.) Exopodite about ¾ length of dorsal margin of 1st endopodial joint, hirsute distally, with 2 small subterminal bristles. 1st endopodial joint with few spines along dorsal margin and 3 ventral bristles. 2nd endopodial joint: ventral margin with 3 long, spinous, terminal bristles; dorsal margin and medial surface near dorsal margin with stout a-, b-, c-, d-bristles, 1 short proximal bristle with several stout medial spines near its base, 1 cleaning bristle with long spines between b- and c-bristles, 4 cleaning bristles between c- and d-bristles, 1 spinous medial bristle near base of d-bristle (about ½ length of d-bristle); lateral surface with spinous bristle between b- and c-bristles (about ⅔ length of b-bristle), and 1 long bristle between c- and d-bristles; medial surface with spines forming rows. End joint with dorsal claw with ventral teeth near middle, 1 short medial bristle, 1 long lateral bristle, and 3 bristles ventral to claw.

Maxilla (Figure 19*a,b*): Epipodial appendage fairly short, pointed, with faint hairs. Endite I with 4 bristles (3 long, 1 short); endite II with 3 long bristles. Basale: medial surface with 1 proximal bristle near dorsal margin; lateral surface with 1 proximal bristle near middle; ventral margin with 1 proximal bristle, 1 short distal bristle, and 1 long, spinous, terminal bristle; dorsal margin hirsute but without distal bristle. Endopodite: 1st joint with beta-bristle but no anterior bristle; endjoint with terminal bristle almost twice length of beta-bristle.

Fifth Limb (Figure 19*c*): Comb with hairs along distal margin; lateral side with long, spinous, exopodial bristle, 1 small bristle near base of bristle, 2 pairs of bristles near middle of ventral margin, and 2 distal bristles near ventral margin. (Illustrated limb was folded under along middle of ventral margin and is reconstructed in drawing.)

Sixth Limb (Figure 19*d*): Two minute medial spines present in anterodorsal corner; anterior margin with single short bristle; lateral sole with hairs but no bristles along margin; anterior tip of skirt with 2 bristles on ventral margin; posteroventral margin hirsute but without bristles; posterior end of skirt very broad.

Seventh Limb (Figure 19*e*): Each limb with 4 proximal bristles (3 on one side, 1 on other), each bristle with 2–4 bells, and 6 distal bristles, 3 on each side (4 bristles on terminal segment, 2 bris-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tles on next to last segment), each bristle with 2–4 bells. Terminus consisting of opposing combs, each with 7 or 8 spinous teeth.

Furca (Figure 19*f*): Each lamella with 10 claws of which posterior 2 point backwards; long and short slender teeth present along posterior margin of larger claws (not shown on illustrated limb).

Bellonci Organ (Figure 19*g*): Elongate with rounded tip.

Eyes (Figure 19*g*): Medial eye unpigmented, with short dorsal hairs. Lateral eye about twice diameter of medial eye, unpigmented, with about 15 light amber ommatidia (not all shown on illustrated eye).

Upper Lip (Figure 19*g,h*): Consisting of 2 hirsute lobes, each with 3 slender anterior spines; a hirsute lateral flap present on each side of mouth. Anterior spines on saddle between lobes visible in anterior view of lips (Figure 19*h*).

Genitalia (Figure 19*f*): Oval complex organ on each side of body anterior to base of furca.

Posterior of Body (Figure 19*f*): Posterodorsal margin forming rounded right-angle, spinous.

Y-Sclerite (Figure 19*f*): Quite long, but of usual shape for genus.

REMARKS.—The only female in the collection (USNM 158238) bears only 4 or 5 bristles on the dorsal margin of the 3rd joint of the 1st antenna. Because several juvenile males that were examined have 6 bristles in that location, it is considered likely that USNM 158238 may be atypical, and that most females of the species have the usual 6 bristles on the dorsal margin of the 3rd joint.

FIGURE 19.—*Parasterope zeta*, new species, USNM 158238, holotype, female, length 1.02 mm: *a*, right maxilla, medial view; *b*, left maxilla, medial view; *c*, comb of right 5th limb, lateral view; *d*, left 6th limb, lateral view; *e*, 7th limb; *f*, posterior of body showing left lamella of furca, posterodorsal corner, Y-sclerite, girdle, and left genitalia; *g*, anterior of body showing left lateral eye, medial eye, bellonci organ, and upper lip with lateral flap; *h*, anterior view of upper lip, lateral flaps not shown. USNM 158237, paratype, adult male, length 1.38 mm: *i*, lateral view of complete specimen showing left lateral eye and posterior hairs; *j*, left 1st antenna, lateral view; *k*, joints 6–8 of right 1st antenna, medial view; *l*, comb of left 5th limb, lateral view; *m*, posterior of body showing right lamella of furca, Y-sclerite, girdle; *n*, lateral eye; *o*, upper lip and lateral flap, anterior to right.

DESCRIPTION OF ADULT MALE (Figures 19*i–o*, 20*a–f*).—Carapace elongate with large projecting rostrum and narrow posterior (Figure 19*i*).

Ornamentation: Hairs forming vertical row near posterior margin (Figure 19*i*).

Infold: Not examined.

Size: USNM 158237, length 1.38 mm, height 0.68 mm.

First Antenna (Figure 19*j,k*): 1st joint bare. 2nd joint with medial hairs, 1 dorsal bristle, and 1 lateral bristle. 3rd joint with 1 small ventral bristle and 7 dorsal bristles. 4th joint with 1 long dorsal bristle and 2 short ventral bristles. Sensory bristle of small 5th joint with abundant filaments (all filaments not shown on illustrated limb). 6th to 8th joint fused on lateral side. 6th joint with medial bristle near dorsal margin. 7th joint: a-claw slender, shorter than bristle of 6th joint; b-bristle about 3 times length of a-claw, with 4 marginal filaments; c-bristle extremely long, with 19 short, marginal filaments. 8th joint: d-bristle minute; e-bristle about same length as b-bristle, bare with blunt tip; f-bristle extremely long, with about 17 short marginal filaments; g-bristle about twice length of b-bristle, with 9 short marginal filaments.

Second Antenna (Figure 20*a*): Protopodite with short, distal, medial bristle. Endopodite 3-jointed: 1st joint elongate, bare; 2nd joint elongate with 3 short, distal, marginal bristles; 3rd joint reflexed on 2nd, with 1 long proximal bristle and pointed serrated tip. Exopodite: 1st joint elongate with lateral hairs and spines near distal margin; 2nd joint about equal to combined length of joints 3–6; bristles of joints 2–8 with natatory bristles; joints 2–8 with both long hairs and short spines along distal margin; 9th joint with 4 bristles (2 long, 1 medium, 1 short; all with natatory hairs); basal spines absent.

Mandible (Figure 20*b*): Coxale endite: small medial bristle present near base of ventral branch; ventral branch with spines forming 4 oblique rows, tip of branch with 3 minute teeth; ventral margin of dorsal branch with 3 stout

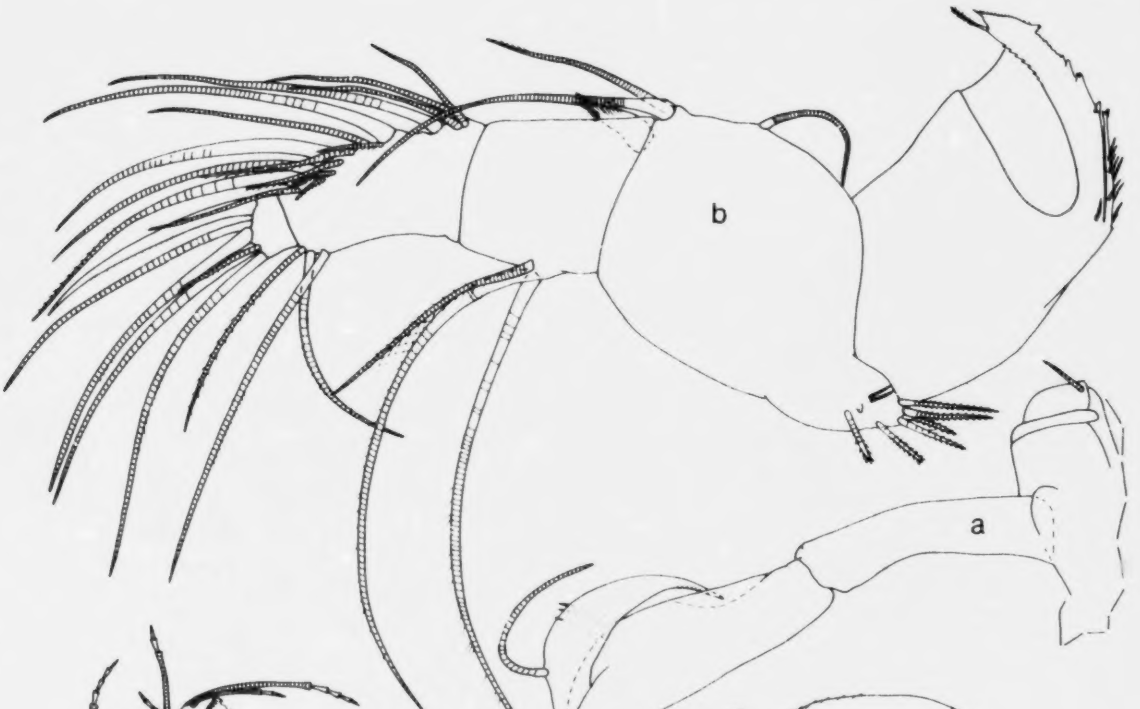


FIGURE 20.—*Parasterope zeta,* new species, USNM 158237, paratype, adult male, length 1.38 mm: *a,* endopodite and part of protopodite of right 2nd antenna, medial view; *b,* right mandible, medial view; *c,* left maxilla, medial view; *d,* right 6th limb, medial view; *e,* 7th limb; *f,* medial eye and bellonci organ. USNM 158236, paratype, juvenile male, length 1.15 mm; *g,* lateral view of complete specimen showing right lateral eye.

double teeth followed by 2 smaller double teeth and crenulate margin; main spine small; distal margin between main spine and pointed tip of branch spinous; dorsal bristle set back from tip of branch and hirsute; dorsal margin of branch serrate distally. Basale endite with 4 spinous end bristles, 2 triaenid bristles, 2 dwarf bristles, and glandular peg. Basale with 3 dorsal bristles (1 near middle, 2 terminal). Exopodite with hirsute tip and 2 small terminal bristles almost reaching middle of dorsal margin of 1st endopodial joint. 1st endopodial joint with 3 spinous ventral bristles. 2nd endopodial joint: ventral margin with 3 terminal bristles; dorsal margin with 3 proximal bristles followed by stout a-, b-, c-, and d-bristles; lateral surface with 1 long bristle between b- and c-bristles, and 1 long bristle between c- and d-bristles; medial surface with 1 short cleaning bristle between b- and c-bristles, 4 cleaning bristles forming oblique row near base of c-bristle, 1 long bristle just distal to base of d-bristle, and short spines forming rows near ventral margin. End joint with 1 stout claw-like bristle (with ventral spines) and 5 ringed bristles.

Maxilla (Figure 20*c*): Epipodial appendage with hirsute pointed tip reaching to about middle of dorsal margin of basale. Endite I with 4 bristles (3 long, 1 short); endite II with 3 long bristles. Basale: medial and dorsal hairs present; medial surface with 1 proximal bristle near middle; ventral margin with 1 short proximal bristle, 1 minute distal bristle, and 1 long, spinous, terminal bristle; lateral surface with 1 short proximal bristle near middle. Endopodite: 1st joint with beta-bristle, but without anterior bristle; endjoint with tip of terminal bristle extending past that of beta-bristle.

Fifth Limb (Figure 19*l*): Tip of comb with long hairs; lateral side with long, stout, epipodial bristle, 1 small slender bristle with base just ventral to base of stout bristle, 2 pairs of bristles near ventral margin, an additional bristle near proximal pair with base almost on ventral margin, and 1 proximal and 2 distal bristles with bases almost on ventral margin; ventral margin with single row of spinous bristles.

Sixth Limb (Figure 20*d*): Medial side with minute spine in anterior proximal corner; anterior margin with single small pointed bristle at suture representing upper endite; none or 1 small bristle at suture representing lower endite; anterior tip of skirt with 2 short bristles on ventral margin; lateral sole hirsute but without bristles; posteroventral margin hirsute but without bristles; posterior end of skirt broad, hirsute.

Seventh Limb (Figure 20*e*): Proximal group with 4 bristles (3 on 1 side, 1 on other); distal group with 6 bristles (3 on each side); each bristle with up to 4 bells; terminus consisting of opposing combs, each with about 18 spinous teeth.

Furca (Figure 19*m*): Each lamella with 9 slender claws; anterior 3 claws strongly curved, remaining claws fairly straight; posterior 3 claws very small, but none oriented dorsally; strong claws with teeth along posterior margins (some teeth longer than others).

Bellonci Organ (Figure 20*f*): Elongate with rounded tip.

Eyes: Medial eye unpigmented (no hairs observed) (Figure 20*f*). Lateral eye larger than medial eye, pigmented light brown, with about 19 ommatidia (Figure 19*i,n*).

Upper Lip (Figure 19*o*): Each hirsute lobe with 2 minute anterior spines; hirsute lateral flap on each side of mouth.

Posterior of Body (Figure 19*m*): Posterodorsal corner forming right angle.

Copulatory Organ (Figure 19*m*): Copulatory limbs consisting of 1 or more lobes anterior to furca (not examined in detail).

Y-Sclerite (Figure 19*m*): Typical for genus.

DESCRIPTION OF JUVENILE MALE (Figure 20*g*).—Carapace similar in shape to that of adult female, but somewhat higher (Figure 20*g*).

Size: USNM 158236, length 1.15 mm, height 0.59 mm.

Lateral Eye (Figure 20*g*): Larger and with more ommatidia than that of adult female.

COMPARISONS.—The female of this species possesses only 1 anterior bristle on the 6th limb, no anterior bristle on the dorsal margin of the basale of the maxilla, no midbristle on the anterior margin of the 1st endopodial joint of the maxilla and 4 proximal bristles on the 7th limb

(3 on one side, 1 on the other). These combined characters separate this species from others in the genus. The specimen appears closely related to *Parasterope hulingsi* Baker, 1978:145, but differs from that species in having a beta-bristle on the 1st endopodial joint of the maxilla.

Heptonema Cohen and Kornicker, 1975

TYPE-SPECIES.—*Heptonema serrata* Poulsen, 1965:329, subsequent designation by Cohen and Kornicker (1975:23).

DISTRIBUTION.—Members of this genus have been collected in the Virgin Islands, West Indies, and in the vicinity of Kei Islands, East Indies. In the present study a new species was collected on the continental shelf off Maine, New Jersey, and North Carolina. The known depth range of the genus is 25–210 m.

COMPOSITION.—Two of the 3 species in this genus are in the study area, *H. serratum* Poulsen and *H. latum*, new species. *Heptonema keiensis* Poulsen, 1965:334 is from the East Indies.

Key to the Species of *Heptonema*

1. First antenna with 4 dorsal bristles on 3rd joint; mandible without dorsal midbristle on basale; 7th limb with 6 proximal bristles . . ***H. serratum***
First antenna with 6 dorsal bristles on 3rd joint; mandible with dorsal midbristle on basale; 7th limb with 4–6 proximal bristles 2
2. Seventh limb with 6 proximal bristles (3 on each side) . . . . . ***H. keiensis***
Seventh limb with 4 proximal bristles (3 on 1 side, 1 on other) . . . . ***H. latum,*** new species

Heptonema serratum Poulsen, 1965

Heptonema serrata Poulsen, 1965:329, figs. 109, 110.

HOLOTYPE.—Ovigerous female, Zoological Museum, Copenhagen.

TYPE-LOCALITY.—West coast of Thatch Island, Virgin Islands, West Indies, 25–30 m.

MATERIAL.—No new material.

DISTRIBUTION.—Virgin Islands, 25–30 m.

DIAGNOSIS.—Carapace short with broadly rounded posterior margin; carapace length of adult female 1.11–1.14 mm (2 specimens); posterior of right valve with narrow curved ridge between broad list and edge of valve.

First Antenna: Dorsal margin of 1st antenna with 4 bristles.

Mandible: Dorsal margin of basale without midbristle.

Seventh Limb: Each limb with 6 proximal bristles, 3 on each side.

Heptonema latum, new species

FIGURES 21–24

Heptonema latum Kornicker in Bowen et al., 1979, fig. 3 [deliberate nomen nudum].

ETYMOLOGY.—The specific name is from the Latin *latus* ("broad, wide"), in reference to the broad posterior end of the 6th limb of this species.

HOLOTYPE.—USNM 156943, 1 ovigerous female in alcohol and on slides.

TYPE-LOCALITY.—Continental shelf, New Jersey, R/V *Columbus Iselin* station F2, 12 Nov 1975, 38°44′14″N, 73°09′08″W, 110–112 m.

ALLOTYPE.—USNM 156799, 1 adult male in alcohol and on slides, from Beaufort Shelf Transect station 61Q, North Carolina.

PARATYPES.—USNM 157697, 1 ovigerous female from R/V *Columbus Iselin* station F4, 7 Nov 1975; USNM 157830, 1 ovigerous female from R/V *Columbus Iselin* station A3, 11 Nov 1975; USNM 157829, 1 juvenile male, from R/V *Columbus Iselin* station F4, 10 Nov 1975; USNM 156942, 1 A-2? male, from R/V *Columbus Iselin* station A4, 11 Nov 1975; 2 specimens from Gulf of Maine.

DISTRIBUTION.—New Jersey, North Carolina, Maine continental shelf and upper slope at depths of 110–239 m.

DESCRIPTION OF ADULT FEMALE (Figures 21–22*f*).—Carapace elongate with short incisur be-

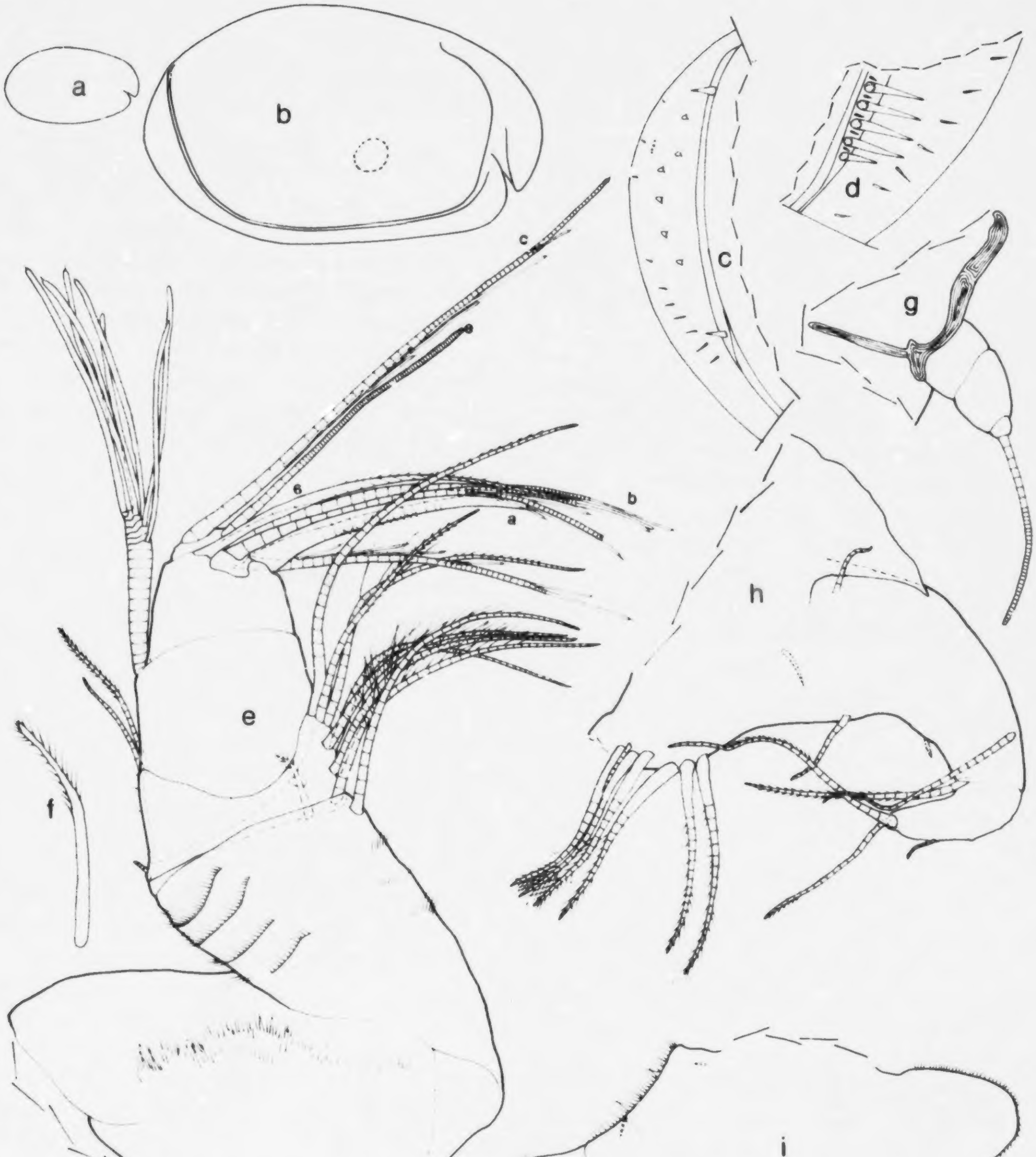


FIGURE 21.—*Heptonema latum*, new species, USNM 156943, holotype, adult female, length 1.66 mm: *a*, lateral view of complete specimen; *b*, inside view of left valve showing outline of central adductor muscle area, marginal infold and position of list; *c*, inside view of posterior of left valve showing bristles and processes between list and valve margin (only upper and lower flap-like bristles of list shown); *d*, inside view of ventral end of posterior infold showing 5 flap-like bristles of list; *e*, right 1st antenna, medial view; *f*, lateral bristle of 2nd joint of left 1st antenna; *g*, endopodite of 2nd antenna; *h*, left maxilla, medial view; *i*, left 6th limb, lateral view.

low valve middle (Figure 21*a,b*); valve highest just posterior to valve middle; in lateral view, posterior less broadly rounded than anterior end; surface smooth.

Infold: Infold behind rostrum with 4 or 5 bristles along distal part of list, about 12 bristles forming row between list and incisur, and about 85 bristles anterior and dorsal to list; about 60 bristles on broad anteroventral infold; about 28 bristles along ventral infold to point opposite lowermost hyaline flap-like bristle on posterior list. List beginning at inner margin of anterior part of infold near incisur, extending along ventral infold and continuing on posterior infold where it broadens; posterior list with about 22 broad transparent flap-like bristles and 22 small bristles (generally 1, and not more than 2, small bristles between each pair of flap-like bristles); the small bristles slightly anterior to flap-like bristles; a field of tubular pores present at bases of flap-like bristles; about 8 bristles and 6 processes present between posterior list and posterior valve margin (Figure 21*c,d*).

Size: USNM 156943, length 1.66 mm, height 1.03 mm; USNM 157697 (distorted valve), length only, about 1.63 mm; USNM 157830, length 1.62 mm, height 1.10 mm.

First Antenna (Figure 21*e,f*): 1st joint spinous. 2nd joint spinous, with 1 long, spinous, dorsal bristle and 1 short, spinous, lateral bristle. 3rd and 4th joints fused, very short; 3rd joint with minute ventral bristle and 6 long, spinous, dorsal bristles. 4th joint with strongly concave distal margin, spines and 2 short bristles on ventral margin, and 1 long spinous bristle on dorsal margin. Sensory bristle of long 5th joint with 7 long terminal filaments. 6th joint with long medial bristle with faint marginal spines. 7th joint: a-claw with faint serrations along dorsal margin; b-bristle about ⅓ longer than a-claw, with 2 short proximal and 3 long terminal filaments including stem; c-bristle long, with about 8 short marginal filaments. 8th joint: d-bristle missing; e-bristle slightly longer than a-claw, with blunt tip; f-bristle bent dorsally, about same length as b-bristle, with 4 or 5 marginal filaments; g-bristle longer than b-bristle, with about 5 short marginal filaments.

Second Antenna: Protopodite with short, bare, medial bristle, long spines on dorsal half of medial surface and along dorsal margin, and shorter spines on ventral part of medial surface. Endopodite 3-jointed (Figure 21*g*): 1st and 2nd joints short, bare; 3rd joint short with long terminal bristle with blunt tip. Exopodite 9-jointed: 1st joint elongate with long hairs forming rows along inner dorsal margin and terminal ventral margin; bristle of 2nd joint reaching 8th joint, with abundant long hair-like spines along ventral margin; 3rd joint about ½ length of 2nd; bristles of joints 3–6 with slender, proximal, ventral spines and distal natatory hairs; bristles of joints 7 and 8 with natatory hairs; 9th joint with 3 bristles (1 long and 1 medium with natatory hairs, 1 short with short marginal spines); joints 2–9 with spines forming row along distal lateral margin; joints 2–6 with spines along distal medial margin; no basal spines.

Mandible (Figure 22*a*): Coxale endite broken off (see description of endite of adult male). Basale: endite with 4 pectinate end bristles, 2 ventral triaenid bristles (with 9 or 10 paired spines excluding terminal pair), 2 dwarf bristles, and small glandular peg; ventral margin bare; dorsal margin with 1 long spinous midbristle and 2 long, spinous, terminal bristles. Exopodite about ¾ length of dorsal margin of 1st endopodial joint, hirsute, with 2 short terminal bristles. 1st endopodial joint with 3 long, spinous, ventral bristles. 2nd endopodial joint: dorsal margin with 1 short proximal bristle and stout spinous a-, b-, c- and d-bristles (c-bristle slightly stouter than others); lateral surface with long spinous bristle between b- and c-bristles, and also between d- and e-bristles; medial surface spinous, with 3 cleaning bristles forming row between b- and c-bristles, 7 cleaning bristles forming oblique row with longest bristle near base of b-bristle, and 1 long spinous bristle with base just distal to d-bristle; ventral margin with 3 long terminal bristles (only 1 shown in illustrated limb) 3rd endopodial joint with straight dorsal claw with ventral

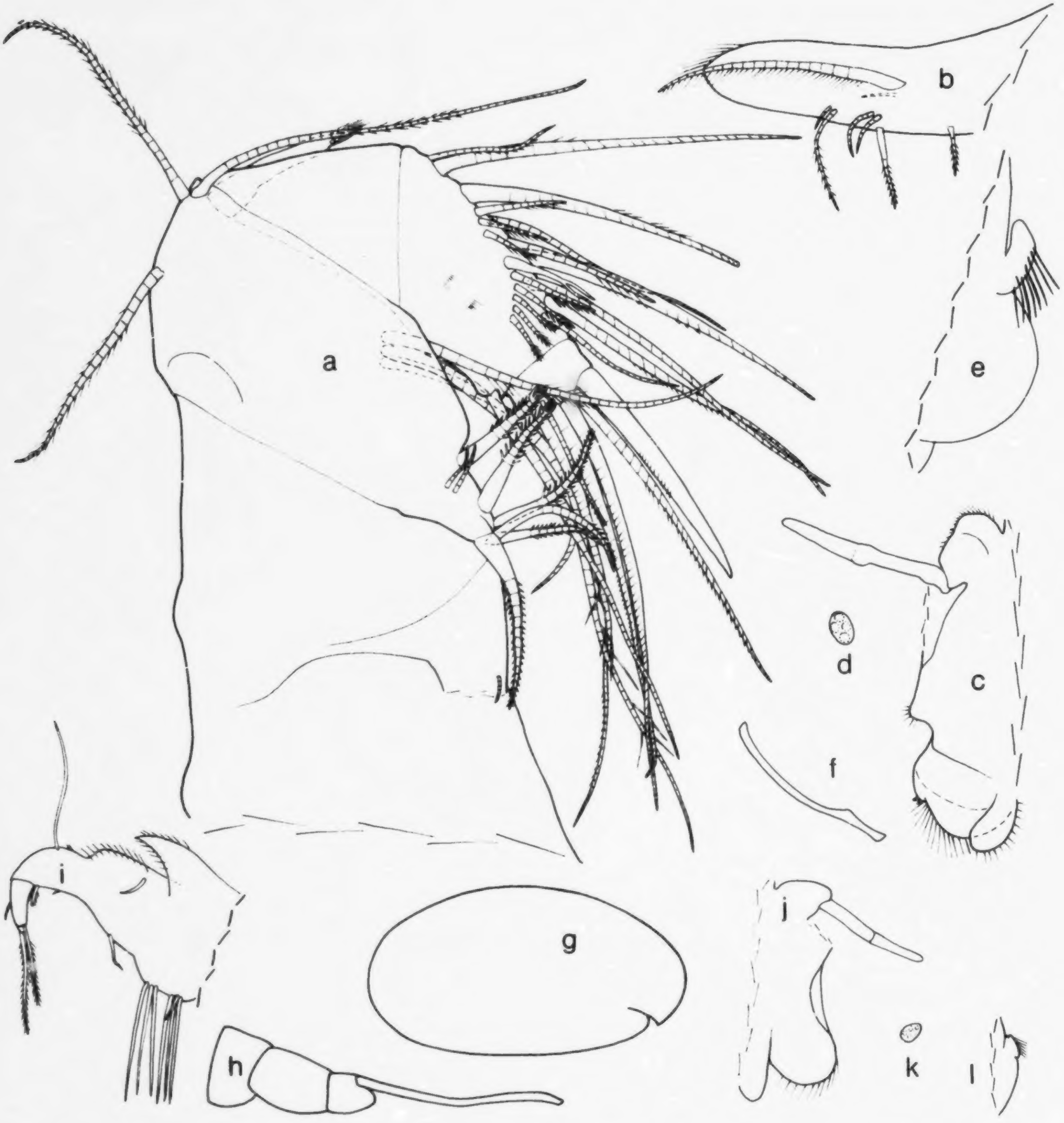


FIGURE 22.—*Heptonema latum*, new species, USNM 156943, holotype, adult female, length 1.66 mm: *a*, left mandible, medial view; *b*, comb of left 5th limb, lateral view; *c*, anterior of body showing medial eye, bellonci organ, upper lip with lateral flap, and spinous process at middle of anterior margin; *d*, lateral eye; *e*, posterior of body showing thumb-like process; *f*, left Y-sclerite, anterior to left. USNM 156942, paratype, juvenile male (A-2? instar), length 1.12 mm: *g*, lateral view of complete specimen; *h*, endopodite of 2nd antenna; *i*, right maxilla, medial view; *j*, anterior of body showing medial eye, bellonci organ, upper lip with lateral flap; *k*, lateral eye; *l*, posterior of body with small thumb-like process.

spines, and 5 bristles (1 short, others long).

Maxilla (Figure 21*h*): 2 endites present: endite I with 4 bristles (1 short, 3 long); endite II with 3 long bristles. Basale: medial side hirsute, with 1 proximal bristle near dorsal margin; dorsal margin hirsute (hairs not shown in illustrated limb), and with 1 long distal bristle; ventral margin with 1 short midbristle, 1 minute distal bristle, and 1 long, spinous, terminal bristle; lateral side with 1 short proximal bristle near middle. Endopodite: 1st joint with short anterior bristle and long spinous beta-bristle; 2nd joint with 1 long, spinous, terminal bristle extending well past beta-bristle. Epipodial appendage fairly short, triangular, hirsute.

Fifth Limb (Figure 22*b*): Comb with stout, spinous, exopodial bristle reaching past end of comb, 1 small slender bristle just ventral to base of stout bristle, and 4 short bristles close to ventral margin; additional 4 bristles present on lateral side almost on ventral margin (2 proximal, and 2 near distal corner); anterior margin of comb with long hairs.

Sixth Limb (Figure 21*i*): Minute medial bristle present just posterior to proximal anterior corner; anterior margin with upper and lower endites indicated by minute suture; upper suture with very small medial bristle; lower endite without bristle. Lateral flap hirsute but without bristles; anterior corner of end joint with 2 or 3 small bristles; posterior end of limb extremely broad; limb hirsute.

Seventh Limb: Each limb with 6 distal bristles (3 on each side) and 4 proximal bristles (3 on one side, 1 on other); bristles with 2–4 bells. Terminus consisting of 2 opposing combs, each with about 15 spinous teeth.

Furca: Each lamella with 9 or 10 pectinate claws (7 strong claws followed by 2 or 3 weaker bristle-like claws); posterior 2 or 3 claws bent backwards.

Bellonci Organ (Figure 22*c*): Elongate, widening near middle, with rounded tip.

Eyes: Medial eye unpigmented, with short hairs along dorsal margin (Figure 22*c*). Lateral eyes smaller than medial eye, pigmented brown, each with 3 or 4 faint ommatidia (Figure 22*d*).

Upper Lip (Figure 22*c*): Consisting of 2 lobes with medial saddle; lobes and saddle hirsute and with 1 or 2 minute anterior spines. A hirsute lateral flap (lower lip) present on each side of mouth.

Posterior of Body: Small, spinous, thumb-like, posterior process (Figure 22*e*).

Y-Sclerite (Figure 22*f*): Unbranched, typical for subfamily.

Gill-like Structures: Well developed.

Eggs: USNM 156943 with 11 eggs in marsupium; USNM 157830 with 6 eggs.

DESCRIPTION OF ADULT MALE (Figures 23, 24).—Carapace unusual in having anterior margin of rostrum somewhat compressed, flaring out in vicinity of incisur (Figure 23*a*); valve highest just anterior to central adductor muscle attachments, and then becoming narrow posteriorly in series of 2 steps, the 1st step being just dorsal to muscle attachments, and the 2nd step being just anterior to vertical row of bristles near posterior end of valve.

Infold: Anterior infold not examined in detail but, in general, similar to that of adult female; list of posterior infold with about 20 flap-like bristles and 1 small bristle between each pair of flap-like bristles; 4 processes and 2 or 3 bristles present between posterior list and posterior end of valve.

Size: USNM 157799, length 2.02 mm, height 1.00 mm.

First Antenna (Figure 23*b,c*): 1st joint bare. 2nd joint with 2 spinous bristles (1 dorsal, 1 lateral). 3rd joint short, triangular, with 1 minute ventral bristle and 7 spinous dorsal bristles. 4th joint short with 2 short ventral bristles and 1 long dorsal bristle. 5th joint minute, with stout sensory bristle with abundant filaments (filaments not shown in illustrated limb). 6th joint long with long medial bristle near dorsal margin. 7th joint: a-claw on short pedestal, claw short with faint dorsal marginal spines; b-bristle with missing tip on both limbs of specimen examined, with 4 marginal filaments on remaining part; c-bristle extremely long, with about 25 short marginal filaments along dorsal margin. 8th joint: d-bristle minute, bare; e-bristle about twice length

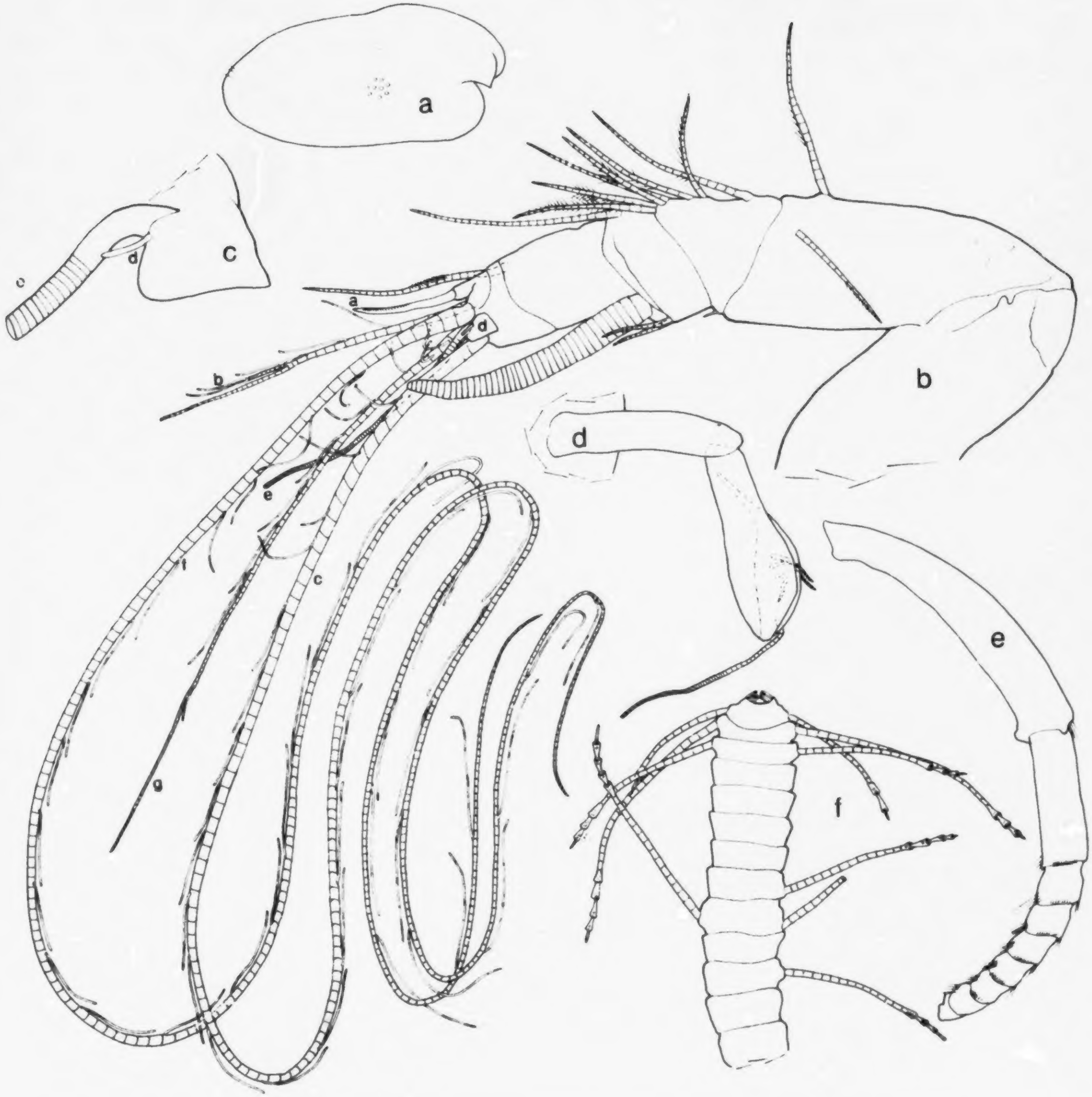


FIGURE 23.—*Heptonema latum*, new species, USNM 157799, allotype, adult male, length 2.02 mm: *a*, lateral view of complete specimen showing outline of right lateral eye, central adductor muscle attachments, and few posterior hairs; *b*, left 1st antenna, lateral view; *c*, detail from *b* showing d- and e-bristles of 8th joint; *d*, endopodite of 2nd antenna; *e*, exopodite of right 2nd antenna, lateral view; *f*, 7th limb.

of a-claw, bare with blunt tip; f-bristle extremely long, with about 25 short marginal filaments along ventral margin; g-bristle about twice length of b-bristle, with about 10 short dorsal filaments.

Second Antenna (Figure 23*d*,*e*): Protopodite with small medial bristle. Endopodite 3-jointed: 1st joint elongate, bare; 2nd joint elongate with 3 short bristles near middle and 1 long subter-

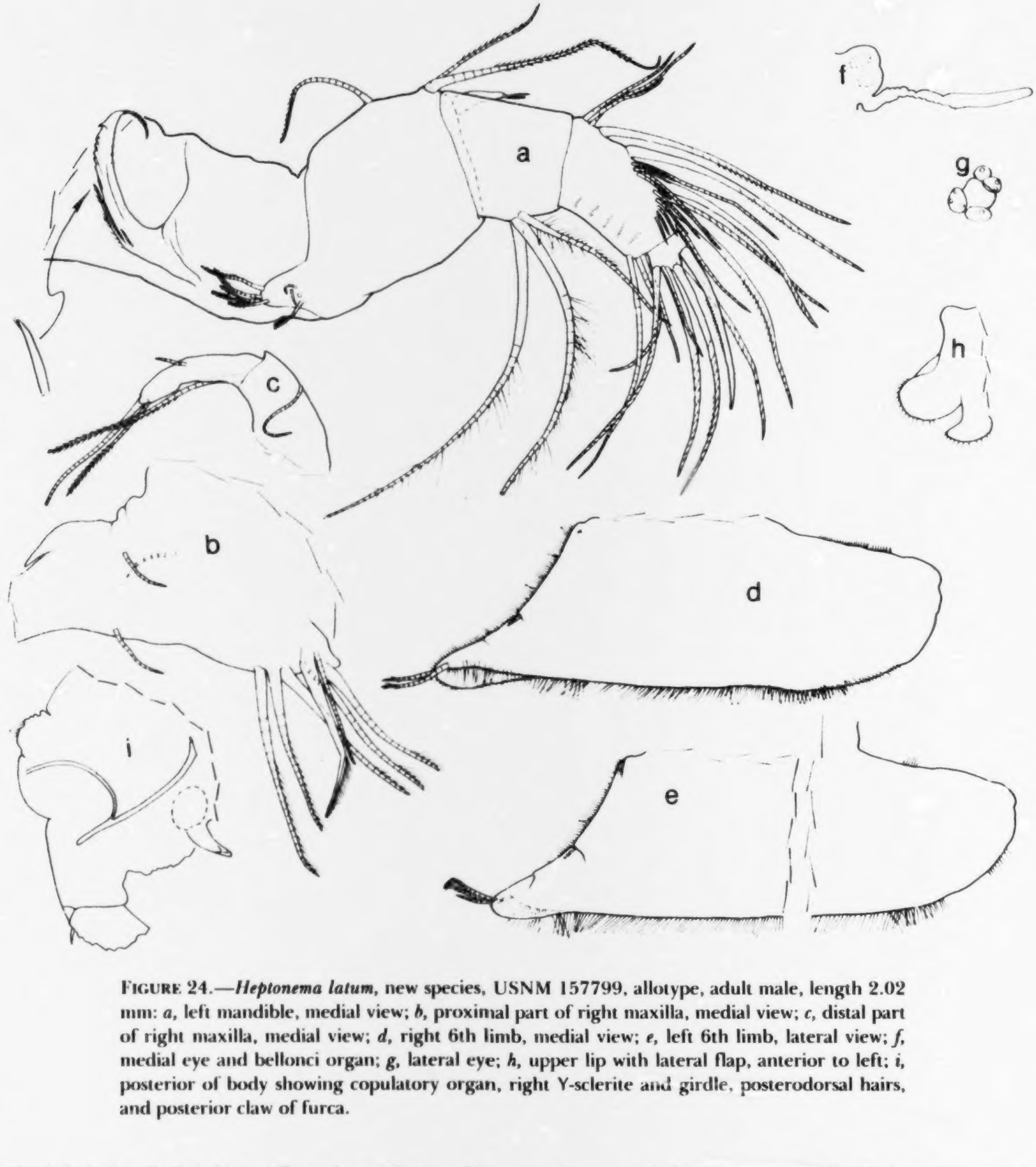


FIGURE 24.—*Heptonema latum*, new species, USNM 157799, allotype, adult male, length 2.02 mm: *a*, left mandible, medial view; *b*, proximal part of right maxilla, medial view; *c*, distal part of right maxilla, medial view; *d*, right 6th limb, medial view; *e*, left 6th limb, lateral view; *f*, medial eye and bellonci organ; *g*, lateral eye; *h*, upper lip with lateral flap, anterior to left; *i*, posterior of body showing copulatory organ, right Y-sclerite and girdle, posterodorsal hairs, and posterior claw of furca.

minal bristle; 3rd joint reflexed on 2nd, with tapered tip. Exopodite: elongate 1st joint with long hairs along distal margin; 2nd joint elongate, about same length as joints 3–6 combined, with long hairs on distal dorsal corner; joints 3–8 short, with long hairs on distal dorsal corner; joints 2–8 with short spines along distal margins; short 9th joint with 3 bristles (2 long, 1 short; all with natatory hairs); bristles of joints 2–8 with natatory hairs, no spines; basal spines absent.

Mandible (Figure 24*a*): Coxale endite: small bristle present at base of ventral branch; ventral branch with spines forming 4 or 5 oblique rows, and with slender tip with hair-like spines; ventral margin of dorsal branch with 7 small processes proximal to small main spine; terminal bristle hirsute (placement of base of bristle not clear on mounted limbs); dorsal margin of dorsal branch serrate. Basale: endite with 4 short end bristles, 2 weakly developed triaenid bristles, 2 dwarf bristles, and small glandular peg; dorsal margin of basale with 1 long midbristle, and 2 long terminal bristles (medial of these with stout base). Exopodite hirsute, reaching middle of dorsal margin of 1st endopodial joint, with 2 short bristles. 1st endopodial joint with 3 spinous ventral bristles. 2nd endopodial joint: ventral margin with 3 spinous terminal bristles (spines not shown in illustrated limb); dorsal margin with 3 short proximal bristles and stout spinous a-, b-, c-, and d-bristles; medial surface spinous, with 9 cleaning bristles forming 2 rows (3 in proximal row, 6 in distal row) and 1 bristle near d-bristle; lateral side with 1 long bristle between b- and c-bristles and between c- and d-bristles. End joint with pectinate dorsal claw, 1 short spinous bristle, and 4 long stout bristles.

Maxilla (Figure 24*c,b*): Similar to that of adult female.

Fifth Limb: Not examined in detail, but, in general, similar to that of adult female.

Sixth Limb (Figure 24*d,e*): Same shape and with similar distribution of bristles as on adult female.

Seventh Limb (Figure 23*f*): Similar to that of adult female.

Furca (Figure 24*i*): Each lamella with 8 claws decreasing in length posteriorly along lamella; last 1 or 2 pairs of claws weak; groups of small teeth alternate with longer teeth along posterior margins of claws; claws decreasing in curvature posteriorly, with claws 4–8 fairly straight.

Bellonci Organ (Figure 24*f*): Similar to that of adult female.

Eyes: Medial eye light amber, bare (Figure 24*f*). Lateral eye about same size as medial eye, with amber central part bearing 4 clear marginal lobes, each with 1 or 2 minute amber ?ommatidia. (Figure 24*g*).

Upper Lip (Figure 24*h*): Similar to that of upper lip of adult female but anterior spines not observed.

Copulatory Organ (Figure 24*i*): Paired copulatory limbs small, each consisting of several lobes.

Posterior of Body (Figure 24*i*): Undulate posterodorsal corner with spines, but thumb-like process as on adult female not observed.

Y-Sclerite (Figure 24*i*): Similar to that of adult female.

DESCRIPTION OF JUVENILE MALE (A-2? instar) (Figure 22*g-l*).—Carapace elongate with dorsal margin considerably more convex than ventral margin. (Figure 22 *g*).

Size: USNM 156942, length 1.12 mm, height 0.63 mm.

First Antenna: 1st joint spinous. 2nd joint spinous, with 1 dorsal and 1 lateral bristle; 3rd and 4th joints very short; 3rd joint with 4 long dorsal bristles and 1 minute ventral bristle; distal margin of 4th joint concave. with 1 long dorsal bristle. Sensory bristle of long 5th joint with 6 terminal filaments. 6th joint with long medial bristle. 7th joint: a-claw with minute teeth along dorsal margin, remaining bristles, in general, similar to those of adult female. 8th joint: d-bristle minute; e-bristle almost reaching tip of sensory bristle of 5th joint; f-bristle bent dorsally, with 5 short filaments; g-bristle, in general, similar to that of adult female.

Second Antenna: Prodopodite with long spines along dorsal margin and on dorsal half of medial surface, and with 1 short medial bristle. Endopodite 3-jointed (Figure 22*h*): 1st joint short bare; 2nd joint bare, longer than 1st joint; 3rd joint about same size as 1st joint, with long bristle near middle. Exopodite: 9th joint with 3 bristles (1 long, 2 short); remaining joints similar to those of adult female.

Mandible: Central branch of coxale endite similar to that of adult male (dorsal branch broken off on specimen examined). Exopodite about

¾ length of dorsal margin of 1st endopodite joint, hirsute with 2 small bristles. 2nd endopodial joint with 5 cleaning bristles (1 in proximal row, 4 in distal row); c-bristle wider at base than b- and d-bristles; a-bristle narrower than b-bristle. Remaining limb similar to that of adult male and female.

Maxilla (Figure 22*i*): Similar to that of adult female except with longer distal bristle on dorsal margin of basale.

Fifth Limb: Not examined in detail but, in general, similar to that of adult female.

Sixth Limb: Similar to that of adult female.

Seventh Limb: 4 proximal bristles (3 on one side, 1 on other); 4 distal bristles (2 on each side); bristles strongly tapering, each with 1 bell; terminus consisting of opposing combs.

Furca: Each lamella with 6 claws; posterior claw bristle-like, bending backwards.

Bellonci Organ (Figure 22*j*): Elongate, with medial suture and rounded tip.

Eyes: Medial eye bare, lightly pigmented. Lateral eyes minute, unpigmented, each with about 5 faint ommatidia.

Upper Lip: Similar to that of adult female (anterior spines not shown on illustrated lip).

Posterior of Body (Figure 22*l*): With small, spinous, thumb-like, dorsal process.

DEVELOPMENT.—The A-2? male described herein bears only 6 terminal filaments on the sensory bristle of the 5th joint of the 1st antenna, not 7 as on the adult female. The 7th limb bears 4 proximal bristles on the 7th limb as on the adult female and adult male (3 on one side, 1 on other), but the bristles are strongly tapered and each have only 1 bell. The furcal lamellae have fewer claws than on adults.

COMPARISONS.—The new species, *H. latum*, differs from the 2 previously described species in the genus In having 4 proximal bristles (3 on one side, 1 on other) rather than 6 (3 on each side) on the 7th limbs, in having poorly developed lateral eyes, and in other characters. It differs from the only other species of the genus known in the study area, *H. serratum*, in having 6 instead of 4 bristles on the dorsal margin of the 3rd joint of the 1st antenna, and in being larger (carapace length of adult female 1.62–1.66 mm compared to 1.11–1.14 mm).

Bathyleberis Kornicker, 1975

TYPE-SPECIES.—*Bathyleberis grossmani* Kornicker, 1975:538.

DISTRIBUTION.—Members of this genus have been reported from the Antarctic Ocean, southern Atlantic and Pacific Oceans, and in the vicinity of New Zealand by Kornicker (1975:539). Baker (1979:287) reported 3 new species of *Bathyleberis* from the continental shelf off southern California. Hiruta (1979:99) described a new species from the Japan Sea off Hokkaido. Chavtur (1978:154, 1983:81) described a new species from the Kurile Islands and polar waters. A new species described herein is from the Gulf of Mexico off Texas. Known depth range of the genus is intertidal to 4303 m.

COMPOSITION.—The genus is represented in the study area by a new species, *B. toxotes*.

REMARKS.—In the present study a paratype of *Bathyleberis californica* was examined for comparative purposes. I have found it expedient to include herein a supplementary description of the species.

Bathyleberis californica Baker, 1979

FIGURE 25

Bathyleberis californica Baker, 1979:287, figs. 1, 2.

HOLOTYPE.—AHF 5740, adult female, length 2.66 mm.

TYPE-LOCALITY.—Sta 4817, north of Point Conception, California, 34°30′20″N, 120°32′45″W, bottom depth 50.3 m (Baker, 1979:287).

MATERIAL.—USNM 151394, adult female paratype, sta 4837, off Ventura, California, 34°06′45″N, 119°17′50″W, bottom depth 64.1 m (data from Baker, 1979:287).

SUPPLEMENTARY DESCRIPTION OF ADULT FEMALE (Figure 25).—Carapace elongate (Figure 25*a*.

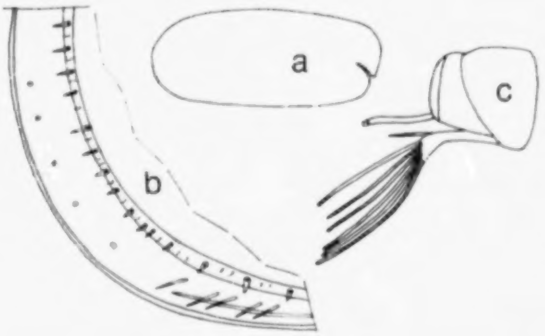


FIGURE 25.—*Bathyleberis californica* Baker, USNM 525394, paratype, adult female, length 2.66 mm: *a*, outline of left valve, medial view; *b*, inside view of posterior of left valve showing bristles and process of the infold, including bristles of list; *c*, medial view of joints 5–7 of right 1st antenna showing sensory bristle of 5th joint and proximal part of c-bristle of 7th joint.

Infold (Figure 25*b*): Posterior infold with 5 small processes between list and valve edge.

Size: USNM 151394, left valve, length 2.66 mm, height 1.21 mm, height 45.5 percent of length.

First Antenna: Base of proximal of the long terminal filaments of sensory bristle of 5th joint at point slightly past base of c-bristle of 7th joint (Figure 25*c*).

Second Antenna: Protopodite with medial spines near dorsal margin and 1 minute, distal medial bristle. Exopodite: bristle of 2nd joint reaching 9th joint, with ventral spines; natatory bristles of joints 3–8 with few, faint, proximal, ventral spines; joints 4–8 with small basal spines; 9th joint with lateral spine about ½ length of 9th joint; joints 2–8 with small, faint spines forming row along distal margins.

Mandible: 2nd endopodial joint: dorsal margin with spinous a-, b-, c-, and d-bristles, 3 small proximal spines (2 of these with bases on medial surface), and 1 small spinous bristle proximal to a-bristle; lateral surface with long bristle between c- and d-bristles; medial side near dorsal margin with 1 short cleaning bristle between a- and b-bristles, 1 cleaning bristle between b- and c-bristles, 6 cleaning bristles forming oblique row near base of c-bristle, and 1 long spinous bristle just distal to base of d-bristle.

Maxilla: Endite I with 3 long spinous bristles and 1 short slender bristle. Basale: medial surface near dorsal margin with 1 proximal bristle and 1 midbristle; ventral margin with 1 proximal bristle, 1 minute distal bristle, and 1 long, spinous, terminal bristle; lateral surface with 1 proximal bristle.

Lateral Eye: Each with 8 large divided, amber ommatidia.

Bathyleberis toxotes, new species

FIGURES 26, 27

ETYMOLOGY.—The specific name is from the Greek *toxotes* ("archer, bowman") and is named for Thomas E. Bowman.

HOLOTYPE.—USNM 158232, adult female on slides and in alcohol.

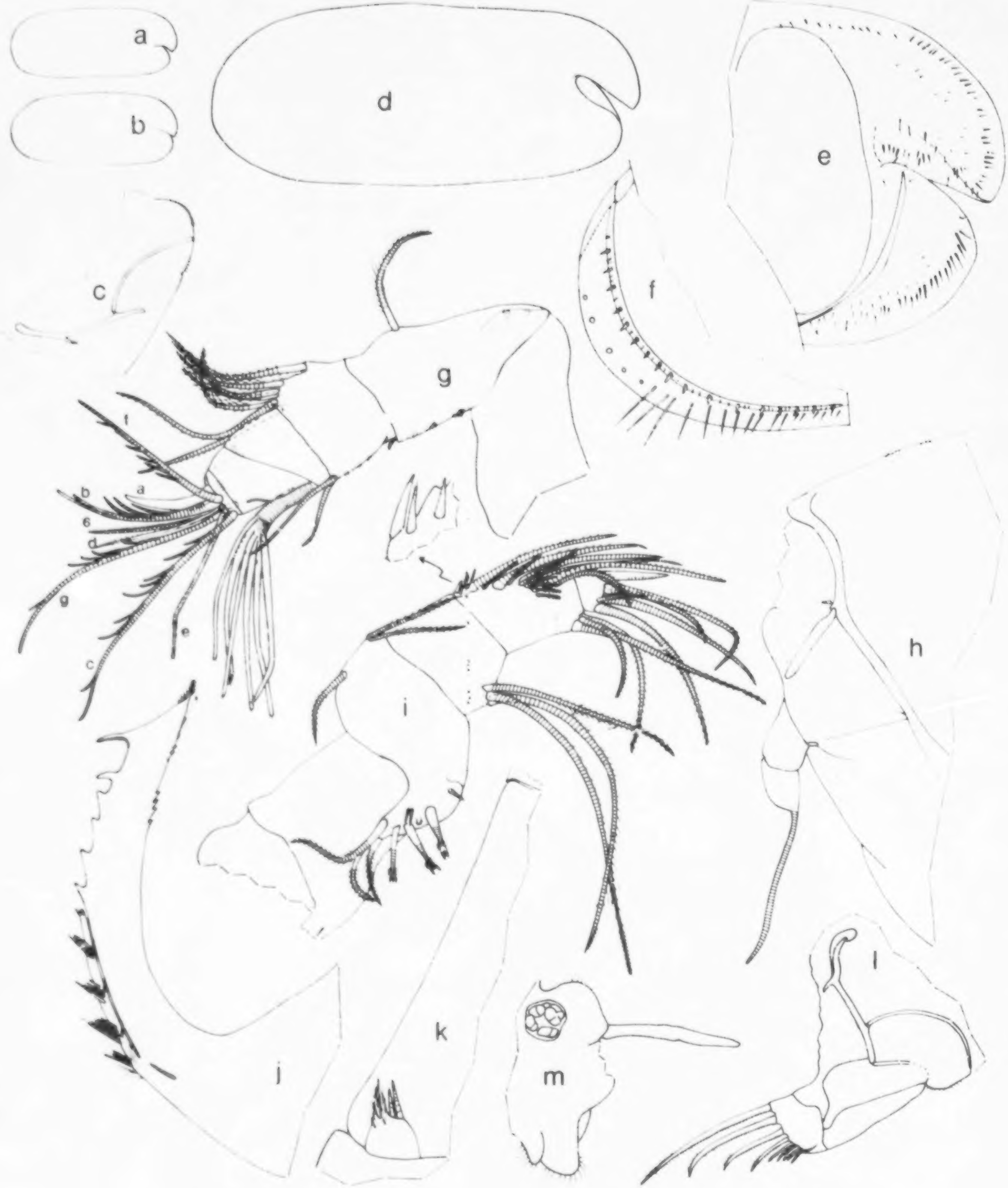
TYPE-LOCALITY.—Gulf of Mexico, off Galveston, Texas, R/V *Gyre*, cruise 11, sta 8.

PARATYPES.—R/V *Gyre*, cruise 10, sta 16, USNM 158498, 1 juvenile male. R/V *Gyre*, cruise 11: USNM 158233A, 158233B, 1 adult female and 1 juvenile male, respectively, from same sample as holotype; USNM 158497, 1 juvenile female (molting), sta 2; USNM 158495, 1 adult female, sta 7; USNM 158496, 1 juvenile male, sta 12.

DISTRIBUTION.—Continental shelf off Texas at depths of 50–58 m.

DESCRIPTION OF ADULT FEMALE (Figures 26, 27).—Carapace extremely elongate with incisur at midlength of anterior margin; dorsal and ventral margins linear, parallel; anterior and posterior margins almost evenly rounded (Figure 26*a,b,d*).

Infold: Infold behind rostrum with about 25 bristles forming row near and parallel to anterior margin of rostrum (Figure 26*e*); about 10 smaller additional bristles along anterior end of dorsal margin; about 9 bristles forming row parallel to and just above dorsal margin of incisur; about 15 additional bristles in vicinity of rostral list;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numerous minute bristles present on rostral infold posterior to the row of bristles just within anterior margin of rostrum; about 4 small bristles present at inner end of ventral margin of incisur; about 36 bristles on broad anteroventral infold in area extending from incisur to point where bristles form single row along ventral margin; ventral margin with about 30 bristles forming single row ending posteriorly at point where list becomes broad. List beginning at inner margin of anterior part of infold near incisur, extending along ventral margin, and continuing on posteroventral and posterior infold where it broadens; broad posteroventral and posterior list with about 17 broad transparent flap-like bristles and about 27 small bristles (1 or 2 small bristles between each pair of flap-like bristles); posteroventral infold with about 16 bristles between broad list and valve edge (posterior 3 or 4 of these bristles unusually long); posterior infold with 4 or 5 processes between list and valve margin (Figure 26*f*). Selvage ventral to incisur bearing broad lamella prolongation.

Selvage: Broad lamella prolongation with marginal fringe present along ventral margin of incisur; fringed lamella prolongation also present along posterodorsal margin; serrated selvage observed along posterior edge of valve (not shown in illustrated valve).

Size: USNM 158232, length 1.78 mm, height 0.93 mm, height 52.2 percent of length; USNM 158495, 1.71 mm, height 0.74 mm, height 43.3 percent of length; USNM 158233A, length 1.73 mm, height 0.75 mm, height 43.4 percent of length.

FIGURE 26.—*Bathyleberis toxotes,* new species, USNM 158233A, paratype, adult female, length 1.73 mm: *a,* lateral view of complete specimen. USNM 158495, paratype, adult female, length 1.71 mm: *b,* lateral view of complete speciman; *c,* posterior of body showing Y-sclerite, girdle, and posterodorsal corner. USNM 158232, holotype, adult female, length 1.78 mm: *d,* lateral view of complete specimen; *e,* inside view of anterior of left valve; *f,* inside view of posterior of left valve; *g,* left 1st antenna, lateral view; *h,* protopodite and endopodite of right 2nd antenna, medial view; *i,* left mandible, medial view; *j,* coxale endite of left mandible, medial view; *k,* exopodite of right mandible, lateral view; *l,* posterior of body showing left lamella of furca, left genital organ (stippled oval), left Y-sclerite and left girdle; *m,* anterior of body showing right lateral eye, medial eye and bellonci organ, and upper lip with lateral flap.

First Antenna (Figure 26*g*): 1st joint with lateral spines. 2nd joint with ventral and lateral spines and 1 spinous dorsal bristle. 3rd joint with poorly defined suture separating it from 4th joint; 3rd joint with small ventral bristle and 6 dorsal bristles (proximal 5 of these with long marginal spines; distal bristle with short marginal spines); 4th joint with 1 dorsal bristle with short marginal spines, 2 ventral bristles, and spines forming rows on lateral surface and ventral margin. 5th and 6th joints separated by diagonal suture; 5th joint with lateral spines forming distal row near dorsal margin; sensory bristle short, stout, with small proximal filament, and 6 long terminal filaments; 6th joint with few lateral spines forming rows, and 1 stout medial bristle. 7th joint: a-claw bare, recurved, about same length as combined lengths of 5th and 6th joints; b-bristle stout, almost twice length of a-claw, with 4 marginal filaments (the distal of these with marginal spines); c-bristle almost twice length of b-bristle, with 8 short marginal filaments. 8th joint: d- and e-bristles on small pedestal bearing lateral pore; d-bristle shorter than b-bristle, slender, unringed, with pointed tip and faint marginal spines; e-bristle stouter and longer than d-bristle, with distinct proximal rings and faint more closely spaced distal rings, tip blunt; f-bristle bent dorsally, with 5 marginal filaments, some with spines; g-bristle same length as c-bristle, with 5 marginal filaments.

Second Antenna (Figure 26*h*): Protopodite with medial and dorsal spines, and minute, distal, medial bristle. Endopodite with only 1 distinct suture near middle; long terminal bristle with blunt tip. Exopodite: bristle of 2nd joint reaching distal end of 9th joint, with few proximal ventral spines followed by slender, spine-like hairs along both margins; long bristles of joints 3–8 with few proximal spines and distal natatory hairs; 9th joint with 3 bristles (1 long, 1 medium, both with natatory hairs, 1 short, with small marginal hairs); joints 4–8 with small triangular basal spines; 9th joint with stout lateral spine about twice length of spine of 8th joint, and about ⅔ length of 9th joint; joints 2–8 with slender spines forming row along distal margin (spines along medial side of 3rd joint much longer than others).

Mandible: Coxale endite (Figure 26*j*): minute medial bristle near base of ventral branch; ventral branch with spines forming 4 groups and tip with 3 minute teeth (ventral of these larger than others); ventral margin of dorsal branch with 4 teeth (some paired) followed by small recurved tooth and then main spine; margin of branch between main spine and tip appearing smooth and bearing 3 or 4 distal hairs; tip extended with fairly long marginal hairs; dorsal bristle hirsute (broken off on illustrated limb); dorsal margin of dorsal branch with few distal serrations. Basale endite with 3 pectinate terminal bristles, 3 triaenid bristles (with 3 pairs of teeth in addition to terminal pair), 2 minute dwarf bristles, and glandular peg (Figure 26*i*). Basale: ventral margin with 1 small medial bristle proximal to U-shaped depression; dorsal margin with 3 spinous bristles (1 at midlength, 2 terminal); lateral surface with spines forming rows (more abundant near dorsal margin). Exopodite minute, hirsute, with 2 small terminal bristles (Figure 26*k*). 1st endopodial joint with 3 stout, spinous, ventral bristles. 2nd endopodial joint: ventral margin with 3 stout terminal bristles; dorsal margin with 3 small proximal spines (2 of these with bases on medial surface; see detail on Figure 26*i*), 2 small proximal bristles, and stout, spinous, a-, b-, c-, and d-bristles; lateral surface with long bristle between c- and d-bristles; medial side near midlength of dorsal margin with 1 short cleaning bristle between a- and b-bristles, 1 cleaning bristle between b- and c-bristles, 6 cleaning bristles forming oblique row near base of c-bristle, and 1 long spinous bristle just distal to base of d-bristle; medial surface also with spines forming few rows near ventral margin. 3rd endopodial joint with short, straight, terminal claw, and 5 spinous bristles.

Maxilla (Figure 27*a*): Epipodial appendage hirsute distally; tip not reaching midbristle located near dorsal margin of basale. Endite I with 4 bristles (3 long, 1 short); endite II with 3 long bristles. Basale: medial surface and dorsal margin hirsute; medial side with 1 proximal bristle, and 1 midbristle near dorsal margin; ventral margin with 1 proximal bristle, 1 minute distal bristle, and 1 long, spinous, terminal bristle; lateral side with 1 short proximal bristle. 1st endopodial joint hirsute, with 1 short anterior bristle, and 1 long beta-bristle. 2nd endopodial joint with terminal bristle extending past beta-bristle.

Fifth Limb: Comb (Figure 27*b*): dorsal margin with long distal hairs; lateral side with long, spinous, exopodial bristle, 2 small slender bristles near base of long bristle, 2 pairs of small bristles near middle of ventral margin, 1 longer bristle proximal to paired bristles and closer to ventral margin, and 2 distal bristles with bases very close to ventral margin; ventral margin with 28 bristles forming single row (bristles with marginal hairs that flair near tip of bristle; distal bristle longer than others).

Sixth Limb (Figure 27*c*): Anterior margin with well-defined endite sutures, each bearing 1 spinous bristle; anterior tip of skirt with 6 spinous bristles; lateral flap with long hairs but no bristles; middle part of ventral margin of skirt with 12 or 13 spinous bristles separated by narrow space from 6 longer hirsute bristles. No medial spine observed near proximal anterior corner of limb.

Seventh Limb (Figure 27*d*): Each limb with 6 proximal bristles (3 on each side) and 6 distal bristles (3 on each side); each bristle with up to 5 bells; terminus consisting of opposing combs, each with about 12 spinous teeth.

Furca (Figure 26*l*): Each lamella with 10 claws, posterior of these bent dorsally; main claws with teeth along posterior margins (some teeth longer than others), and hairs along anterior margins.

Bellonci Organ (Figure 26*m*): Elongate with rounded tip.

Eyes (Figure 26*m*): Medial eye unpigmented, with few dorsal hairs. Lateral eye smaller than

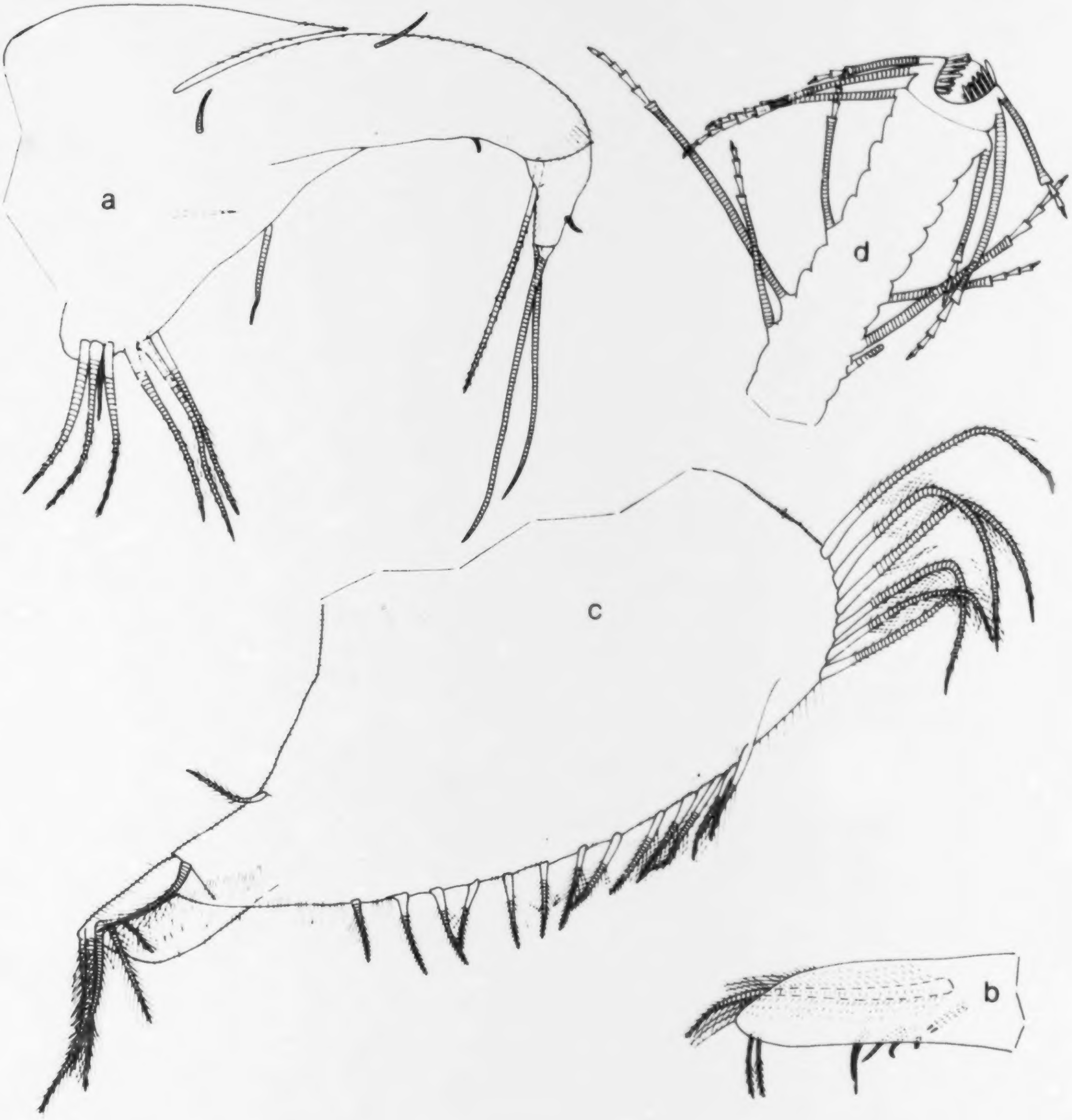


FIGURE 27.—*Bathyleberis toxotes*, new species, USNM 158232, holotype, adult female, length 1.78 mm: *a*, left maxilla, medial view; *b*, comb of right 5th limb, medial view; *c*, right 6th limb, medial view; *d*, 7th limb.

medial eye, unpigmented, with 6 divided ommatidia.

Upper Lip (Figure 26*m*): Consisting of 2 hirsute lobes, each with minute anterior spines some distance from ventral edge of lobe; a spinous hirsute flap present on each side of mouth posterior to lobes.

Genitalia (Figure 26*l*): Oval organ on each side of body anterior to furca (dotted on illustration).

Posterior of Body (Figures 26*c*): Posterodorsal corner rounded, hirsute.

Y-Sclerite (Figures 26*c,l*): Dorsal branch well developed; ventral branch longer than usual for subfamily, oriented posteroventrally.

COMPARISONS.—The only previously described species of *Bathyleberis* having a minute mandibular exopodite similar to that of the new species *B. toxotes* is *B. californica* Baker, 1979:287. A supplementary description of the latter species based on a female paratype from California is presented herein. The major difference in the morphology of *B. californica* and *B. toxotes* is size. The length of the female *B. californica* is given by Baker (1979:293) as 2.66–2.69 mm, whereas the range of length of the female *B. toxotes* based on 3 specimens is 1.71–1.78 mm. An additional difference is that about ⅔ of the length of the posterior 3 or 4 bristles of the posteroventral infold of *B. toxotes* extends past the valve edge, whereas bristles in a similar position on *B. californica* are relatively short (compare Figure 25*b* with Figure 26*f*). Also, the stem of the sensory bristle of the 5th joint of the female 1st antenna of *B. toxotes* is relatively shorter than that of *B. californica:* the base of the proximal terminal filament of the sensory bristle of *B. toxotes* is proximal to the base of the c-bristle, whereas it is either opposite the base of the c-bristle, or is distal to it, on *B. californica* (compare Figure 25*c* with Figure 26*g*).

Synasterope Kornicker, 1975

TYPE-SPECIES.—*Synasterope implumis* Poulsen, 1965:421, subsequent designation by Kornicker (1975:440).

DISTRIBUTION.—Members of this genus are widespread between latitudes of about 42°N and 73°S. Known depth range 1–4450 m. The genus is reported from the Gulf of Mexico for the first time herein.

COMPOSITION.—The genus is represented in the study area by 8 species: *Synasterope* species 1 (Bowen et al., 1979, fig. 3); *S. longiseta* Poulsen, 1965:417; *S. implumis* Poulsen, 1965:421; *S. serrata* Poulsen, 1965:427; *S. cushmani* Kornicker, 1974a:11; *S. setisparsa* (Kornicker, 1958:239); *S. psitticina* (Darby, 1965:31); *S. williamsae,* new species. The key includes only species in study area.

Key to Selected Species of *Synasterope*

1. Posteroventral margin of 6th limb with few (less than 5) bristles; lateral eyes well developed and with dark pigment 2

Posteroventral margin of 6th limb with many (more than 10) bristles, lateral eyes minute or absent 5

2. First antenna with lateral bristle on 2nd joint, 5 dorsal bristles on 3rd joint, and short stout stem on female sensory bristle (base of proximal filament of sensory bristle located proximal to midlength of a-claw); dorsal margin of mandibular basale with midbristle ...... ***S. serrata***

First antenna without lateral bristle on 2nd joint, 6 dorsal bristles on 3rd joint, and long slender stem on female sensory bristle (base of proximal filament of sensory bristle located distal to midlength of a-claw); dorsal margin of mandibular basale without midbristle 3

3. List (ridge) of posteroventral infold of each valve of width usually present in Cylindroleberidinae (see Figure 33*c,d*), and with convex posterior edge; anterior corner of skirt of 6th limb with 2 long plumose bristles .... ***S. longiseta***

List of posteroventral infold of each valve unusually broad, and with well-defined, linear, posterior edge bearing minute spines (spines may be absent on list of right valve) (see Figure 31*b,c*); anterior corner of 6th limb with either 2 short bristles or 1 long and 1 short bristle . . . 4

4. Anterior corner of 6th limb with 2 short bristles; protopodite of 2nd antenna with small distomedial bristle . . . . ***S. implumis***
Anterior corner of 6th limb with 1 short and 1 very long bristle (long bristle about 5× length of short bristle); protopodite of 2nd antenna without distomedial bristle . . . . ***S. setisparsa***

5. Ventral margin of basale of maxilla with 3 proximal bristles forming row . . . . ***Synasterope*** species 1
Ventral margin of basale of maxilla with 1 proximal bristle 6

6. Distal bristle of dorsal margin of basale of maxilla not reaching past distal end of dorsal margin of basale . . . . ***S. cushmani***
Distal bristle of dorsal margin of basale of maxilla reaching well past distal end of dorsal margin of basale 7

7. Length of adult female about 1.2 mm . . . . . ***S. williamsae,*** new species
Length of adult female about 1.8 mm . . . . ***S. psitticina***

Synasterope psitticina (Darby, 1965)

FIGURE 28

Cylindroleberis psitticina Darby, 1965:31 [part], pl. 19: fig. 6, pl. 20: figs. 1, 2, 5, 8.
Synasterope psitticina.—Kornicker, 1974a:18, fig. 11.

HOLOTYPE.—UMMP 48801, adult female on slides, length 1.80 mm.

TYPE-LOCALITY.—Continental shelf off Sapelo Island, Georgia. Depth range of the species given by Darby (1965:32) is 45 to 405 feet (13.7 to 123 m), but his material included more than 1 species. The exact depth of the holotype is unknown.

MATERIAL.—Holotype.

DISTRIBUTION.—Known only from type-locality.

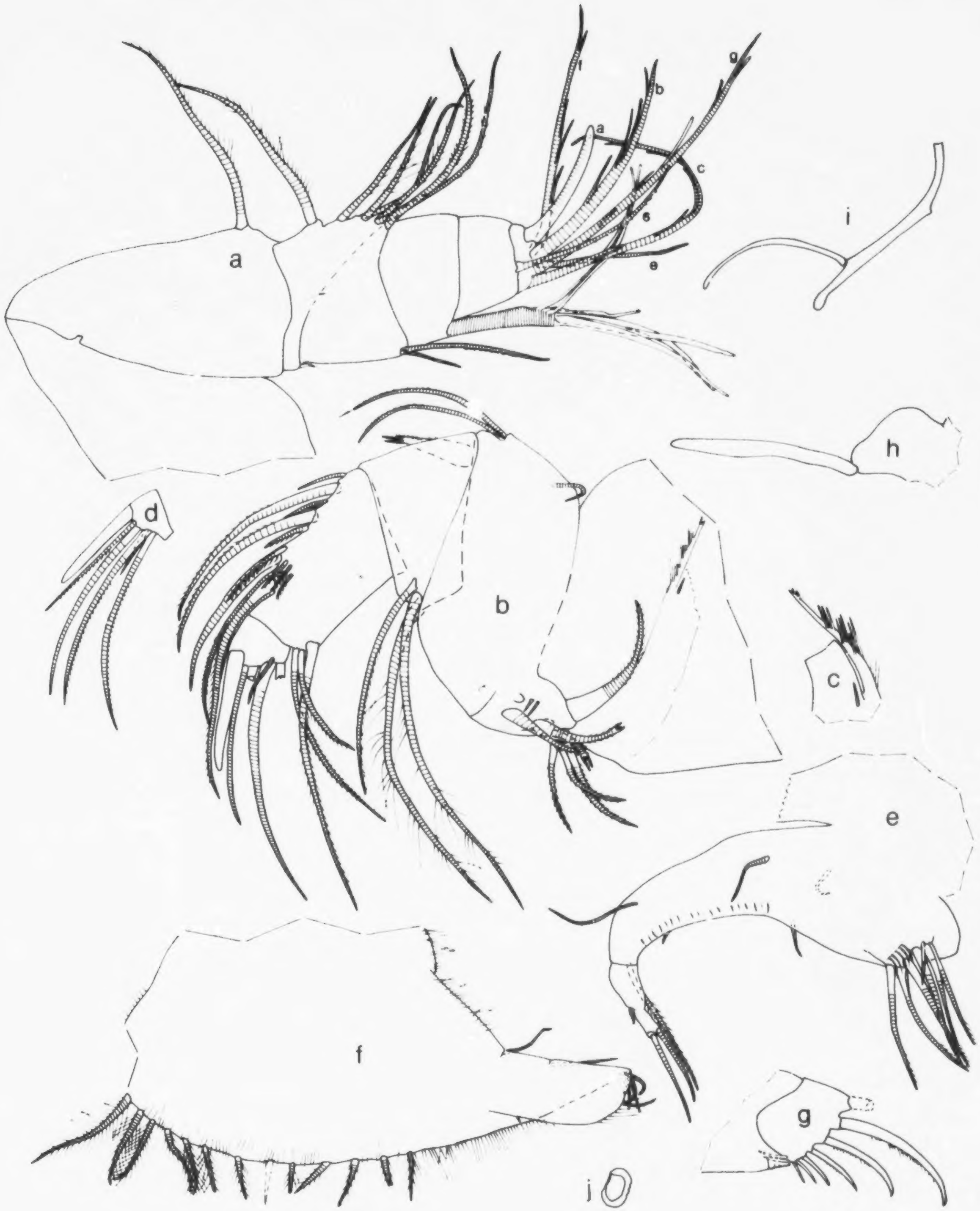
SUPPLEMENTARY DESCRIPTION OF ADULT FEMALE HOLOTYPE (Figure 28).—Carapace elongate with evenly rounded anterior and posterior and slightly convex ventral and dorsal margins (see Darby, 1965, pl. 19: fig. 6).

Infold: Obscure on slides but seemingly of general type found in genus; posterior list not unusually wide.

Size: Holotype, UMMP 48801, length 1.80 mm, height 0.57 mm (Darby, 1965:32).

First Antenna (Figure 28*a*; also see Darby, 1965, pl. 20: fig. 1): 1st joint with medial and lateral spines and minute, bifurcate, medial projection on distal margin. 2nd joint with medial spines, 1 short, lateral, distal bristle, and 1 long, spinous, dorsal bristle. 3rd and 4th joints quadrate, separated by suture less distinct medially than laterally; distal margin of 4th joint concave; 3rd joint with 1 small bristle on short ventral margin, and 6 dorsal bristles; 4th joint with 2 slender ventral bristles and 1 stouter dorsal bristle. Sensory bristle of 5th joint with 6 terminal filaments. 6th joint with long medial bristle with faint marginal spines. 7th joint: a-claw bare, about same length as combined 5th and 6th joints; b-bristle about 1½ times length of a-claw, with 3 marginal filaments; c-bristle longer than f-bristle, and reaching well past distal end of sensory bristle of 5th joint, with about 5 marginal filaments. 8th joint: d-bristle represented by minute peg; e-bristle slightly longer than a-claw, bare with blunt tip; f-bristle bent dorsally, with 4 marginal ventral filaments; g-bristle about same length as c-bristle, with 5 marginal filaments.

Second Antenna: Protopodite with short, distal, medial bristle, but without medial spines. Endopodite fairly short, weakly 3 jointed, about ½ length of 1st exopodial joint, with terminal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bristle reaching to about middle of 3rd exopodial joint. Exopodite: bristle of 2nd joint reaching to 7th or 8th joint, with ventral spines, but no natatory hairs; bristles of joints 3–5 with natatory hairs and few small ventral spines; bristles of joints 6–8 with natatory hairs, no spines; 9th joint with 3 bristles (1 long with natatory hairs, 2 shorter, either bare or with few short hairs); joints 2–8 with slender spines forming row along distal margin; 9th joint with 2 lateral spines (larger of these about same length as 9th joint); basal spines absent.

Mandible (Figure 28*b–d*; also see Darby, 1965, pl. 20: fig. 2): Coxale endite: small medial bristle present at base of ventral branch; ventral branch with proximal ventral hairs and spines forming 3 oblique rows; tip of branch with 2 or 3 minute teeth; ventral margin of dorsal branch with 2 pointed processes followed by 2 or 3 low rounded processes and main spine (remainder of branch obscure). Basale endite with 4 end bristles, 3 triaenid bristles, 2 dwarf bristles, and small glandular peg; dorsal margin of basale with 1 short midbristle, and 2 long, subequal, subterminal bristles (both reaching just past distal end of 1st endopodial joint); lateral side of basale with spines forming rows near dorsal margin; medial side of basale with 1 minute bristle near base of endite. Exopodite about ¾ length of dorsal margin of 1st endopodial joint, hirsute, with 2 short subterminal bristles. 1st endopodial joint with 3 long, spinous, ventral bristles. 2nd endopodial joint: ventral margin with 3 spinous distal bristles; dorsal margin with 1 short proximal bristle, and bristle-like a-, b-, c-, and d-bristles (c-bristle bare, others with marginal spines); medial side with 1 short cleaning bristle between a- and b-bristles, 1 cleaning bristle between b- and c-bristles, 4 cleaning bristles forming oblique row near base of c-bristle, 1 spinous bristle just distal to base of d-bristle, and faint spines forming rows near ventral margin; lateral side with 1 long spinous bristle between c- and d-bristles, but none between b- and c-bristles. End joint with straight bare claw and 5 bristles (medial of these short).

FIGURE 28.—*Synasterope psitticina* (Darby), UMMP 48801, holotype, adult female, length 1.80 mm: *a*, left 1st antenna, medial view; *b*, right mandible, medial view; *c*, ventral branch of coxale endite of left mandible, lateral view as seen through coxale; *d*, 3rd endopodial joint of left mandible, lateral view; *e*, right maxilla, medial view; *f*, right 6th limb, lateral view; *g*, left lamella of furca, medial view; *h*, medial eye and bellonci organ; *i*, right Y-sclerite and girdle, anterior to right; *j*, right genital organ.

Maxilla (Figure 28*e*; also see Kornicker, 1974a:19 fig. 11): Endite I with 1 short and 3 long bristles; endite II with 3 long bristles, and stout hairs forming row near base of bristles. Epipodial appendages with pointed tip reaching to about middle of dorsal margin of basale. Basale: medial side spinous and hirsute, with 1 proximal and 1 longer distal bristle ("dorsal bristles"); ventral margin with 1 short proximal bristle, 1 minute distal bristle, and 1 long, spinous, terminal bristle. Endopodite: 1st joint with 1 short anterior bristle and 1 long beta bristle; 2nd joint with long terminal bristle (tip broken off on illustrated limb).

Sixth Limb (Figure 28*f*): Anterior margin with upper and lower sutures representing endites, each with 1 bristle; lateral flap with marginal hairs, 1 short, slender, distal bristle, and 1 minute, proximal, spine-like bristle (on right limb only); anterior end of skirt with 5 short bristles; ventral and posteroventral margin with more than 13 bristles (posterior corner of right limb of holotype fragmented; whole limb probably had 3 or 4 additional bristles on posterodorsal corner; only anterior half of left limb of holotype present on slide).

Seventh Limb: 6 bristles in proximal group (3 on each side); 6 bristles in distal group (3 on each side); each bristle with 2–4 bells. Terminus consisting of opposing combs, each with 10 or 11 spinous teeth.

Furca (Figure 28*g*; also see Darby, 1965, pl. 20: fig. 8): Each lamella with 9 claws (posterior 2 of these bristle-like, oriented backwards); claw 1 of right lamella anterior to claw 1 of left lamella; claws 1–7 with long teeth interspersed with groups of short teeth along posterior margins (not all shown on illustrated limb); lamella following claws projecting slightly and with minute marginal teeth.

Bellonci Organ (Figure 28*h*; also see Darby, 1965, pl. 20: fig. 5): Elongate with rounded tip.

Eyes: Medial eye well developed, bare (Figure 28*h*). Lateral eyes: none present on slides of holotype; according to Darby (1965:32) lateral eyes of female absent or very reduced.

Genitalia (Figure 28*j*; also see Darby, 1965, pl. 20: fig. 8): Oval sclerotized ring on each side of body anterior to furca.

Posterior of Body: Slide somewhat obscure, but posterior apparently evenly rounded, without thumb-like process.

Y-Sclerite (Figure 28*i*; also see Darby, 1965, pl. 20: fig. 8): Typical for genus.

Synasterope setisparsa (Kornicker, 1958)

FIGURES 29–32

Asteropina setisparsa Kornicker, 1958:239, figs. 46, 9A–B, 62A–D, 63A–D, 64A–E, 86L–P.

Synasterope setisparsa.—Poulsen, 1965:396, 401, 402, 421, 431, 469 (map).

HOLOTYPE.—Ovigerous female, lost.

LECTOTYPE.—USNM 122901 (Kornicker, 1958:241, specimen number 127G), ovigerous female from Bimini area. Designated herein.

TYPE-LOCALITY.—Bimini area, Great Bahama Bank.

MATERIAL.—Lectotype. San Salvador, Bahamas: USNM 158336, 1 adult female; USNM 158384A, 158384B, 2 juvenile females; USNM 158384C, 1 juvenile; USNM 158402, 5 juveniles.

DISTRIBUTION.—Bimini and San Salvador, Bahamas, at depths of 1–5 m.

DIAGNOSIS.—Carapace: Posterior infold of left valve with straight list having posterior spines forming row.

First Antenna: Adult female without lateral bristle on 2nd joint. Sensory bristile of adult female with long stem and 6 terminal filaments.

Second Antenna: Protopodite without distal medial bristle.

Mandible: Coxale endite with small bristle near base of ventral branch; basale without midbristle on dorsal margin, and with longer of 2 terminal dorsal bristles reaching b- or c-bristle on dorsal margin of 2nd endopodial joint; lateral bristle between b- and c-bristles absent on adult female; medial bristle near base of d-bristle of 2nd endopodial joint fairly short.

Maxilla: Dorsal margin of basale with short distal bristle. Endite I with 2 long and 1 short bristles.

Fifth Limb: Lateral side of comb with 2 slender bristles just ventral to base of long, spinous, exopodial bristle.

Sixth Limb: Ventral and posteroventral margin of skirt with very few bristles (not more than 2 or 3). Anterior tip of skirt with 1 very long stout bristle and 1 or 2 small bristles.

Seventh Limb: With total of 12 bristles (6 proximal, 6 distal).

Lateral Eyes: Well developed and pigmented black.

Posterior of Body: With thumb-like dorsal process.

SUPPLEMENTARY DESCRIPTION OF ADULT FEMALE (Figures 29–31).—Carapace elongate with subparallel, slightly convex, dorsal and ventral margins in lateral view (Figures 29*a*, 31*a*). Black lateral eyes visible through valve (Figure 31*a*); deep narrow incisur present on anteroventral margin; posterior of valves evenly rounded.

Infold (Figure 31*b–d*): Rostral infold with numerous small bristles forming row parallel to anterodorsal margin of rostrum and many smaller bristles posterior to the outer row; additional small bristles present on anteroventral infold ventral to incisur. Wide posteroventral list with 20–25 faint flap-like bristles and few minute spines; posterior edge of posterior list linear, well defined on both valves, but with abundant spines only on left valve (Figure 31*c*,*d*).

Size: USNM 122901, 1 lectotype, length of dry specimen 1.48 mm, height 0.77 mm [Kornicker, 1958:241, gave length of this specimen

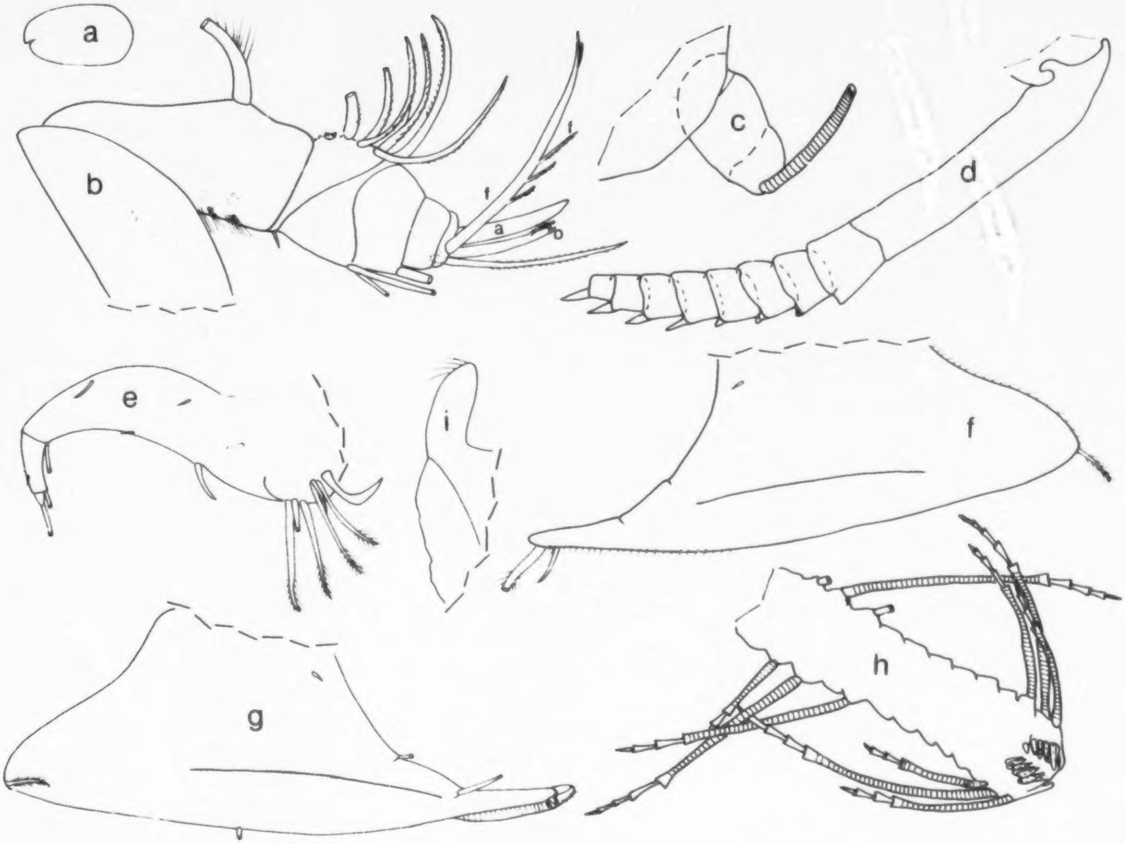

FIGURE 29.—*Synasterope setisparsa* (Kornicker), USNM 122901, paratype, adult female, length of dry specimen 1.48 mm; *a*, outline of complete specimen; *b*, right 1st antenna, lateral view; *c*, endopodite of 2nd antenna; *d*, exopodite of 2nd antenna; *e*, right maxilla, medial view; *f*, right 6th limb, medial view; *g*, left 6th limb, medial view; *h*, 7th limb; *i*, thumb-like dorsal process.

as 1.5 mm, and height as 0.78 mm]. USNM 158336, length 1.47 mm, height 0.74 mm. Kornicker (1958:241) gave dimensions of lost holotype as length 1.54 mm, height 0.75 mm, and an ovigerous female (Number 122D-3) as length 1.52 mm, height 0.77 mm.

First Antenna (Figures 29*b*, 30*e*): 1st joint with faint lateral spines forming rows, and longer medial spines. 2nd joint with lateral and medial spines and 1 spinous dorsal bristle; no lateral bristle present. 3rd and 4th joints quadrate; 3rd joint with minute ventral bristle and 6 spinous dorsal bristles; 4th joint with 1 spinous dorsal bristle, 2 slender ventral bristles, and concave distal margin. Sensory bristle of long 5th joint slender with 6 terminal filaments. Medial bristle of 6th joint long, spinous. 7th joint: a-claw stout, about combined length of joints 5–8; b-bristle stout, with 3 dorsal filaments near middle; c-bristle reaching past tip of sensory bristle of 5th joint, with 5 short marginal filaments. 8th joint: d-bristle absent; e-bristle bare with blunt tip not reaching tip of sensory bristle; f-bristle bent dorsally, with 3 spinous filaments near middle and

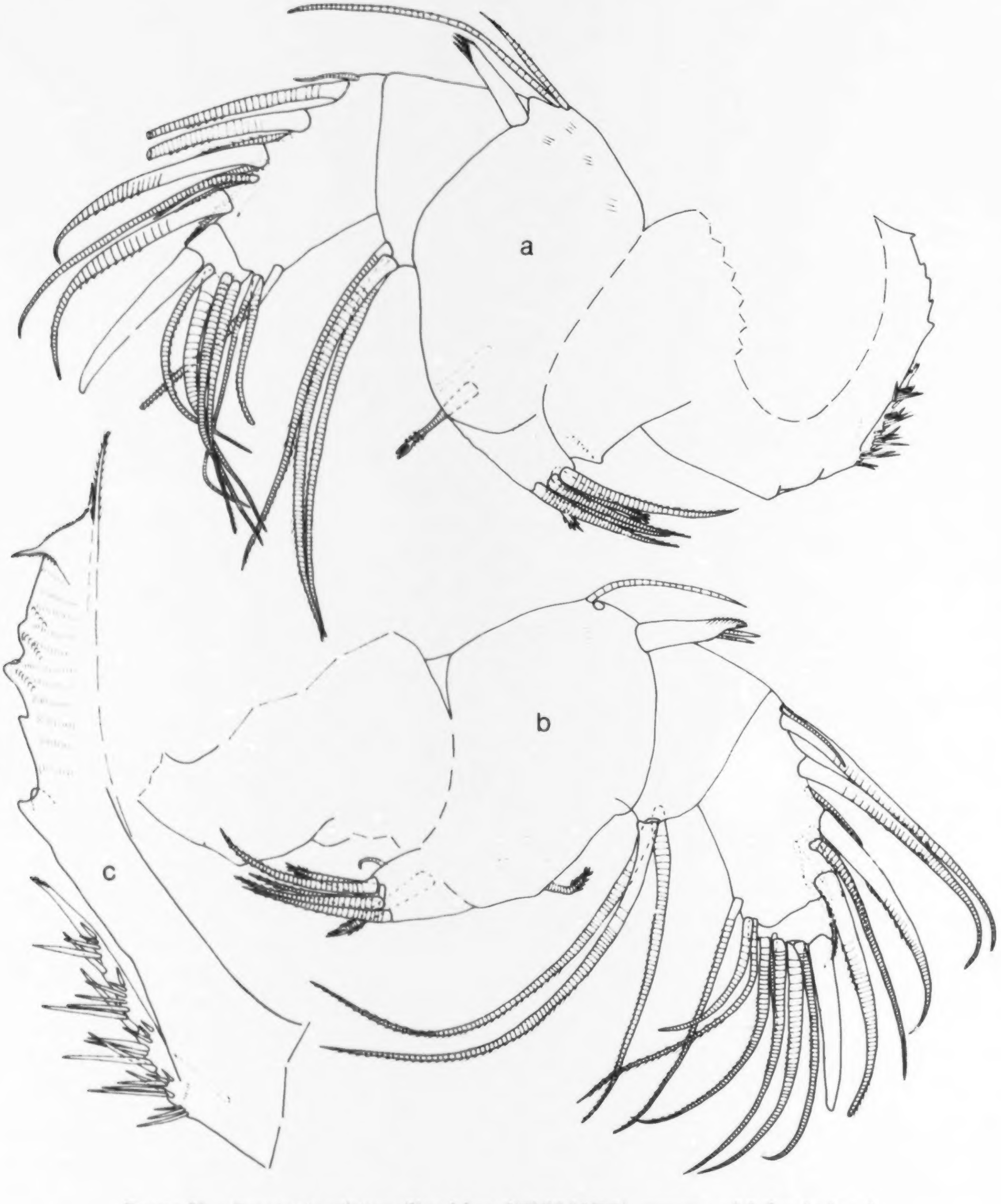

FIGURE 30.—*Synasterope setisparsa* (Kornicker), USNM 122901, paratype, adult female, length of dry specimen 1.48 mm: *a*, left mandible, lateral view; *b*, right mandible, lateral view; *c*, coxale endite of right mandible, lateral view.

bifurcate tip; g-bristle about same length as c-bristle, with 5 short filaments near middle of dorsal margin.

Second Antenna (Figures 29*c,d*, 31*f*): Protopodite with medial spines on dorsal half but without distomedial bristle. Endopodite 3-jointed; 3rd joint with long terminal bristle. Exopodite: bristle of 2nd joint reaching just past 9th joint, with ventral spines; bristles of joints 3–8 with ventral spines and natatory hairs; 9th joint with 3 bristles (1 long bristle with ventral spines and natatory hairs, 2 shorter bristles with short marginal hairs); joints 3–8 with basal spines becoming larger on distal joints; 9th joint with long lateral spine; joints 2–8 with short slender spines forming lateral row along distal margin.

Mandible (Figure 30*a–c*): Coxale endite (Figure 30*c*): Small medial bristle present near base of ventral branch of endite; ventral branch with spines forming 5 oblique rows, and pointed tip with about 5 minute spines; ventral margin of dorsal branch with stout double tooth followed by 3 smaller teeth and main spine; hirsute dorsal bristle present with base set back from tip of branch. Basale endite with 4 end bristles, 2 or 3 triaenid bristles with few (3 or 4 pairs) marginal teeth, and 1 dwarf bristle. Basale: ventral margin near base of endite with 1 triaenid bristle with 3 or 4 pairs of distal teeth excluding terminal pair, and U-shaped depression; dorsal margin with 2 subterminal bristles (longer of these reaching base of b- or c-bristle of 2nd endopodial joint; length of shorter bristle slightly less than half that of dorsal bristle); lateral surface with few spines forming rows near dorsal margin. Exopodite reaching slightly past middle of dorsal margin of 1st endopodial joint, hirsute distally, with 2 short subterminal bristles. 1st endopodial joint with 3 long, spinous, ventral bristles. 2nd endopodial joint: dorsal margin with 1 small proximal bristle and long, stout, spinous a-, b-, c-, and d-bristle; lateral surface with 1 long bristle between c- and d-bristles, but none between b- and c-bristles; medial surface with 1 short cleaning bristle between the b- and c-bristles, 4 cleaning bristles forming oblique row between c- and d-bristles, and 1 short spinous bristle near base of d-bristle; ventral margin with 3 long, spinous, terminal bristles; medial surface with spines forming rows. End joint with straight stout dorsal claw and 5 bristles (1 of these small and medial).

Maxilla (Figures 29*e*, 31*g*): Epipodite with long, slender, hirsute tip reaching to about middle of dorsal margin of basale. Endite I with 3 bristles (2 long, 1 short); endite II with 3 long bristles. Basale: ventral margin with 1 short, backward-pointing, proximal bristle, 1 minute distal bristle, and 1 long, spinous, terminal bristle; dorsal margin with 1 proximal bristle with base on medial side, and 1 short bristle just distal to middle; lateral surface with 1 short proximal bristle. Endopodite: 1st joint with 1 short anterior bristle near middle and 1 long beta-bristle; end joint with terminal bristle reaching well past beta-bristle.

Fifth Limb: (Figure 31*h*): Exopodial bristles on comb consisting of stout spinous bristle reaching past tip of comb, 2 slender bristles just ventral to base of stout bristle, and 2 pairs of bristles near ventral margin of comb; dorsal margin of comb with hairs near tip; ventral margin of comb with few distal bristles about ⅓ longer than proximal bristles.

Sixth Limb (Figures 29*f,g*, 31*i*): Small medial spine present in anterodorsal corner. Anterior margin with upper and lower bristle; anterior corner of skirt with 1 very long bristle and 1 or 2 small bristles (long bristle about 5 times length of small bristle); 1 or no bristle present in middle of ventral margin and on posteroventral corner; posterior end of skirt not unusually broad; lateral flap at anterior end of skirt hirsute but without bristles.

Seventh Limb (Figure 29*h*): Each limb with 12 bristles, 6 proximal (3 on each side) and 6 distal (3 on each side); each bristle with 2–4 bells. Terminus consisting of opposing combs, each with about 12 spinous teeth.

Furca (Figure 31*j*): Each lamella with 7 or 8 claws decreasing in size posteriorly; posterior claws not oriented backwards.

Bellonci Organ (Figure 31*l*): Elongate, broad-

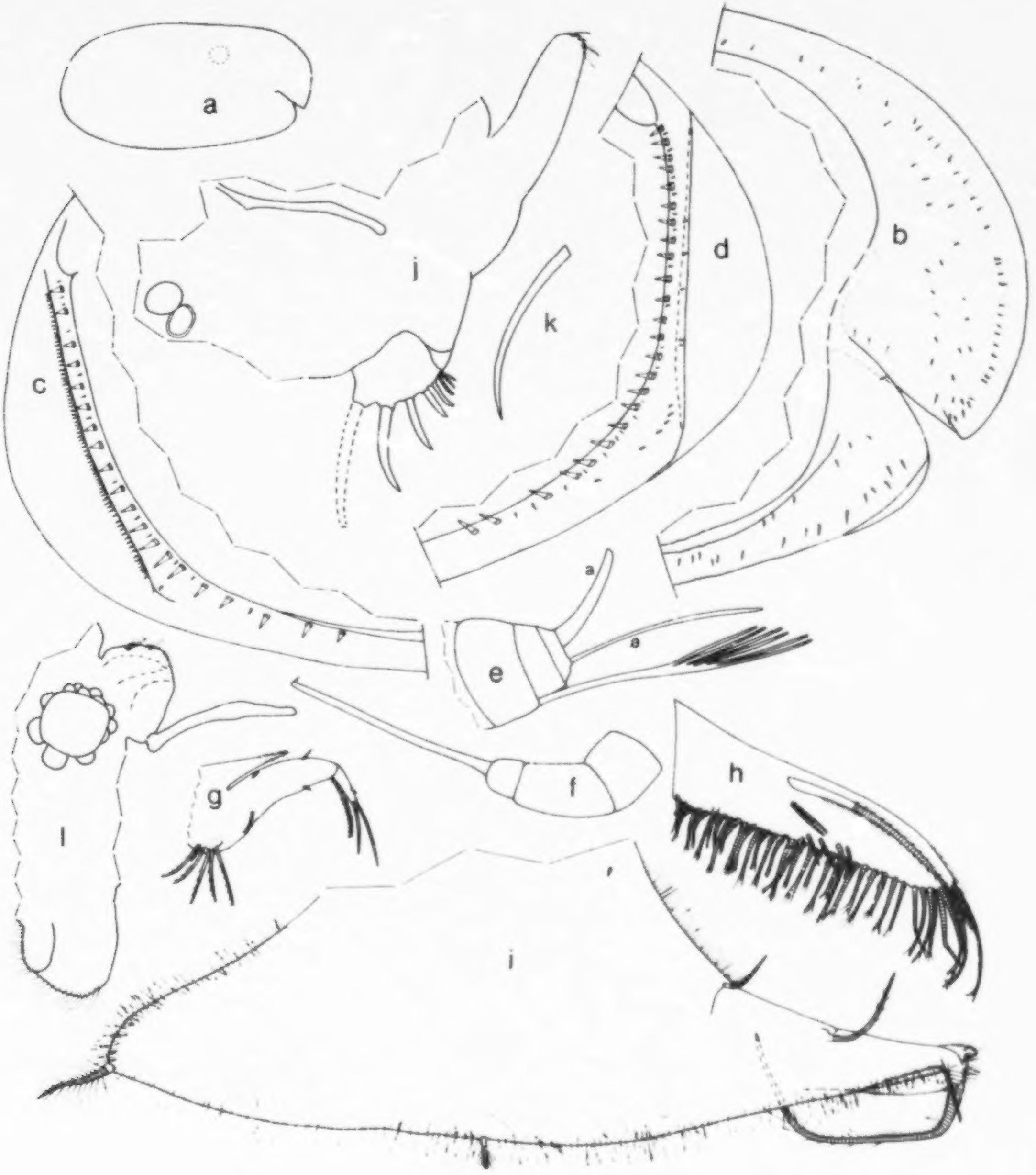

Figure 31.—*Synasterope setisparsa* (Kornicker), USNM 158336, adult female, length 1.47 mm: *a*, lateral view of complete specimen showing outline of lateral eye; *b*, inside view of anterior of left valve; *c*, inside view of posterior left valve; *d*, inside view of posterior of right valve; *e*, joints 5–8 of right 1st antenna, lateral view; *f*, endopodite of left 2nd antenna, medial view; *g*, left maxilla, medial view; *h*, comb of right 5th limb, lateral view; *i*, left 6th limb, medial view; *j*, posterior of body showing thumb-like dorsal process, left lamella of furca, left Y-sclerlite, and left genital organ; *k*, claw 1 of left lamella of furca; *l*, anterior of body showing right lateral eye, medial eye and bellonci organ, and upper lip with lateral flap.

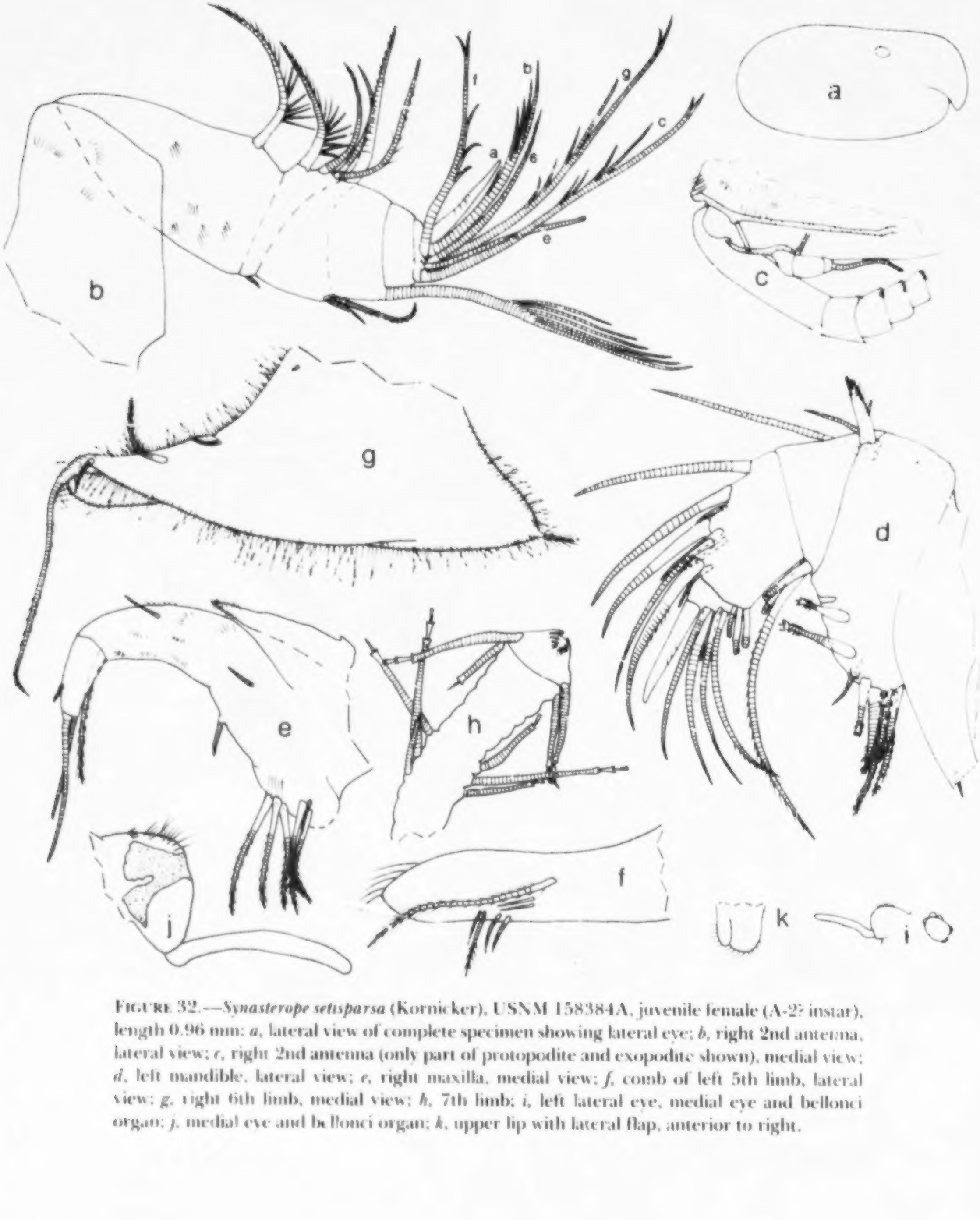

FIGURE 32.—*Synasterope setisparsa* (Kornicker), USNM 158384A, juvenile female (A-2? instar), length 0.96 mm: *a*, lateral view of complete specimen showing lateral eye; *b*, right 2nd antenna, lateral view; *c*, right 2nd antenna (only part of protopodite and exopodite shown), medial view; *d*, left mandible, lateral view; *e*, right maxilla, medial view; *f*, comb of left 5th limb, lateral view; *g*, right 6th limb, medial view; *h*, 7th limb; *i*, left lateral eye, medial eye and bellonci organ; *j*, medial eye and bellonci organ; *k*, upper lip with lateral flap, anterior to right.

ening near middle, with rounded tip.

Eyes (Figure 31*l*): Medial eye with black pigment, hirsute dorsally. Lateral eyes well developed, about same size as medial eye, with black pigment and numerous ommatidia (difficult to count because of black pigment).

Upper Lip (Figure 31*l*): Consisting of 2 hirsute lobes without spines. Hirsute lateral flap present on each side of mouth.

Posterior of Body (Figures 29*i*, 31*j*): With long, thumb-like, dorsal process hirsute distally.

Y-Sclerite (Figure 31*j*): Typical for subfamily (see Kornicker, 1975:686).

Eggs: USNM 122901 with 7 eggs in marsupium.

DESCRIPTION OF JUVENILE FEMALE (A-2? instar) (Figure 32).—Carapace and infold similar in shape and morphology to that of adult female (Figure 32*a*).

Size: USNM 158384A, length 0.96 mm, height 0.50 mm.

First Antenna (Figure 32*b*): Dorsal margin of 3rd joint with 4 spinous bristles; d-bristle represented by minute pointed spine with pore near base; limb otherwise similar to that of adult female.

Second Antenna (Figure 32*c*): Similar to that of adult female.

Mandible (Figure 32*d*): Dorsal branch of coxale endite broken off both limbs of specimen examined. Long subterminal bristle of basale reaching end of 2nd endopodial joint. Endopodite: 2nd joint without bristle proximal to a-bristle on dorsal margin, and only 2 cleaning bristles present between c- and d-bristles. Limb otherwise similar to that of adult female.

Maxilla (Figure 32*e*): Basale: proximal lateral bristle and small, distal, ventral bristle not observed. Limb otherwise similar to that of adult female.

Fifth Limb (Figure 32*f*): Similar to that of adult female.

Sixth Limb (Figure 32*g*): Long bristle at anterior tip of skirt about 7 times length of short bristle. Limb otherwise similar to that of adult female.

Seventh Limb (Figure 32*h*): Bristles tapering distally, and only 4 bristles in distal group (2 on each side); 6 bristles in proximal group (3 on each side); each bristle with 1 or 2 bells. Terminus with opposing combs, each with 8 or 9 spinous teeth.

Furca: Each lamella with 7 claws decreasing in length and width posteriorly along lamella; posterior claws not oriented backwards; posterior margins of claws with short teeth separating longer teeth; claws 1 and 2 with few distal hairs along anterior margin; claw 1 of right lamella anterior to claw 1 of left lamella.

Bellonci Organ (Figure 32*i,j*): Similar to that of adult female.

Eyes: Medial eye with black and brown pigment, hirsute dorsally (Figure 32*i,j*). Lateral eye about same size as medial eye, with many ommatida (difficult to count because of black pigment) (Figure 32*i*).

Upper Lip (Figure 32*k*), *Posterior of Body, Y-Sclerite:* Similar to those of adult female.

Gill-like Structures: Well developed, 7 on each side of posterodorsal part of body.

Synasterope longiseta Poulson, 1965

Synasterope longiseta Poulson, 1965:417, fig. 138.

HOLOTYPE.—Adult female, unique specimen, length 1.40 mm, Zoological Museum, Copenhagen.

TYPE-LOCALITY.—Virgin Islands, West Indies, depth unknown.

MATERIAL.—No new material.

DISTRIBUTION.—Known only from type-locality.

DIAGNOSIS.—List of posterior infold of each valve of normal type, not unusually broad as on *Synasterope setisparsa* (inferred from description of Poulsen, 1965:418); list with about 25 flap-like bristles and about 50 short bristles placed between flap-like bristles or along posterior edge of list (Poulsen, 1965:418).

First Antenna: 2nd joint without lateral bristle; 3rd joint with 6 dorsal bristles; sensory bristle of 5th joint with long slender stem.

Second Antenna: Protopodite without distomedial bristle. Exopodite with basal spines.

Mandible: Coxale without small bristle near base of endite. Basale endite with 1 dwarf bristle. Ventral margin of basale with short bare bristle proximal to U-shaped depression; dorsal margin without midbristle, and with 2 terminal bristles (longer of these reaching end of limb, short bristle about ¼–⅓ length of other).

Fifth Limb: Lateral side of comb with only 2 bristles (1 long, spinous, other small, bare). Ventral margin of comb with distal bristles much longer than proximal bristles.

Sixth Limb: Anterior margin with upper and lower bristle. Anterior corner of skirt with 2 long plumose bristles; ventral margin with 2 small plumose bristles near middle and 2–3 short plumose bristles on rounded posterior corner.

Seventh Limb: Each limb with 12 bristles, 6 proximal (3 on each side) and 6 distal (3 on each side). Terminus with opposing combs, each with about 12 teeth (smaller of these appear bare).

Furca: Each lamella with 6 main claws followed by 2 secondary bristle-like claws (secondary claws not oriented backwards).

Eyes: Medial eye pigmented and with few small hairs. Lateral eyes well developed.

Posterior of Body: Without dorsal process, but hairs on dorsal angle longer than hairs ventral to angle.

Synasterope implumis Poulson, 1965

Synasterope implumis Poulsen, 1965:421, figs. 139, 140.

HOLOTYPE.—Ovigerous female, length 1.27 mm, Zoological Museum Copenhagen.

TYPE-LOCALITY.—Long Point Bay, Virgin Islands, West Indies, shallow water.

MATERIAL.—No new material.

DISTRIBUTION.—Known only from type-locality.

DIAGNOSIS.—List of posterior infold of female broad (broader on right valve); list with about 20 flap-like bristles and about 20 small bristles between them, all bristles placed on proximal band on list; posterior edge of list with numerous small teeth on left valve and finely serrate or smooth on right valve.

First Antenna: 2nd joint without lateral bristles; 3rd joint with 6 dorsal bristles; sensory bristle of 5th joint with long slender stem.

Second Antenna: Protopodite with minute distomedial bristle on female, none on adult male. Exopodite with basale spines.

Mandible: Coxale with small bristle near base of endite. Basale endite with 1 dwarf bristle. Ventral margin of basale with triaenid bristle proximal to U-shaped depression; dorsal margin without midbristle, and with 2 terminal bristles (longer of these reaching b-bristle of 2nd endopodial joint, short bristle ½–¾ length of other).

Sixth Limb: Anterior margin with upper and lower bristles. Anterior corner of skirt with 2 short bristles; ventral margin without bristles near middle and 2 short bristles (with few marginal hairs) on rounded posterior corner.

Seventh Limb: Each limb with 12 bristles, 6 proximal (3 on each side) and 6 distal (3 on each side). Terminus with opposing combs, each with about 12 teeth.

Furca: Each lamella with 6 main claws followed by 2 secondary bristle-like claws (secondary claws oriented backwards).

Eyes: Medial eye pigmented, fringed with short hairs. Lateral eye well developed.

Posterior of Body: Without dorsal process (According to Poulson (1965:426), "the posterior process is developed as low angle with longer hairs").

Synasterope serrata Poulsen, 1965

Synasterope serrata Poulsen, 1965:427, fig. 141.

HOLOTYPE.—Ovigerous female, length 1.00 mm, unique specimen, Zoological museum, Copenhagen.

TYPE-LOCALITY.—Northeast of Hans Lollik, St. Thomas, Virgin Islands, West Indies, at about 50 m.

MATERIAL.—No new material.

DISTRIBUTION.—Known only from type-locality.

DIAGNOSIS.—Carapace, when viewed laterally, narrower in posterior half. Rostral and anteroventral infolds with abundant bristles, many quite small; list of posterior infold with 16–20 flap-like bristles and between then about same number of long thin bristles; 5–7 long bristles forming row between ventral part of posterior list and valve margin.

First Antenna: 2nd Joint with bare lateral bristle; 3rd joint with only 5 dorsal bristles; sensory bristle of 5th joint with short stout stem.

Second Antenna: Protopodite with short mediodistal bristle. Exopodite without basal spines.

Synasterope cushmani Kornicker, 1974

Synasterope cushmani Kornicker, 1974a:11, figs. 6–10.

HOLOTYPE.—Adult female, length 1.59 mm, USNM 143863.

TYPE-LOCALITY.—Station 1424(5), Cape Cod Bay, Massachusetts, depth 35.9 m.

MATERIAL.—Gulf of Maine, off Maine, 5 specimens.

DISTRIBUTIONS.—Cape Code Bay, Massachusetts, off Maine.

DIAGNOSIS.—List of posterior infold not unusually broad, with about 21 flap-like bristles separated by 3, rarely 2, short bristles; about 57 bristle forming row between posterior list and valve margin; 3 or 4 processes present between list and posterior margin, closer to latter.

First Antenna: 2nd joint with spinous lateral bristle; 3rd joint with 6 dorsal bristles; sensory bristle of 5th joint with short stout stem.

Second Antenna: Protopodite with minute distomedial bristle and slender spines forming clusters on anterior half of medial surface. Exopodite: 1st joint without distomedial bristle; 9th joint with broad lateral spine; basal spines absent.

Mandible: Basale endite with 2 dwarf bristles. Ventral margin of basale with small bristle proximal to U-shaped depression; dorsal margin with spinous backward pointing midbristle and 2 terminal bristles of similar length reaching to base of c-bristle.

Maxilla: Basale with distal dorsal bristle.

Fifth Limb: Lateral surface of comb with 1 long spinous bristle, 1 short slender bristle just ventral to base of long bristle, and 2 pairs of bristles near ventral margin of comb.

Sixth Limb: Anterior margin with upper and lower bristle. Anterior corner of skirt with 4 short spinous bristles; lateral sole with 1 short, slender, spinous bristle; posteroventral margin with 13–15 bristles (posterior 6 bristles hirsute, others with long proximal and short distal spines).

Seventh Limb: Each limb with 12 bristles, 6 proximal (3 on each side), 6 distal (3 on each side). Terminus with opposing combs, each with 9–10 spinous teeth.

Furca: Each lamella with 7 main claws and 2 bristle-like secondary claws (last secondary claw oriented backwards).

Eyes: Medial eye bare. Lateral eye absent on both male and female.

Posterior of Body: Without dorsal process, hirsute with broadly rounded dorsal corner.

Synasterope species 1

Synasterope species 1.—Bowen, Smyth, Boesch, and Montrans, 1979, fig. 3

MATERIAL.—1 adult female from sta F2, 12 Nov 1975; 1 adult male from sta A4, 12 Nov 1975.

DISTRIBUTION.—Continental shelf off New Jersey, 110–196 m.

REMARKS.—I identified the 2 specimens listed above received from Marcia Bowen (in litt, 29 Apr 1976). The species is clearly new but is being left in open nomenclature until formally described.

DIAGNOSIS.—*Mandible:* Dorsal margin of basale with midbristle on both sexes.

Maxilla: Ventral margin of basale with 3 proximal bristles forming row.

Lateral Eyes: Absent.

Synasterope williamsae, new species

FIGURES 33, 34

ETYMOLOGY.—The species is named for Mrs. Vernetta M. Williams, Smithsonian Institution, who has assisted the author in preparing slides.

HOLOTYPE.—USNM 158234, ovigerous female on slide and in alcohol.

TYPE-LOCALITY.—Gulf of Mexico, R/V *Gyre*, cruise 11, sta 11.

DISTRIBUTION.—Continental shelf off Texas at a depth of 55 m

DESCRIPTION OF ADULT FEMALE (Figures 33, 34).—Carapace elongate with slit-like incisur below valve middle; posterior truncate dorsally, evenly rounded ventrally; dorsal and ventral margins almost linear (Figure 33*a*).

Infold (Figure 33*b–d*): Infold between list and anterodorsal margin with about 40 bristles (outer bristles short, inner bristles generally minute); infold between list and upper edge of incisur with about 14 bristles forming row; total of about 50 long, short, and minute bristles present on infold below incisur to point on ventral margin where single row of bristles starts; infold of ventral margin with about 10 small bristles forming single row; narrow list along anteroventral and ventral margin becoming broader along posteroventral and posterior margin; broad posteroventral list with about 15 flap-like bristles and about 9 short bristles (not more than 1 short bristle between a pair of flap-like bristles); 3 bristles forming row ventral to anterior end of broad posteroventral list (Figure 33*c*); 3 or 4 processes on infold near posterior margin.

Selvage: Selvage with narrow lamellar prolongation with smooth outer margin, except along ventral margin of incisur where it bears fringe (Figure 33*b*). Fringe also evident at dorsal end of posterior selvage on right valve (Figure 33*c*).

Size: USNM 158324, length 1.16 mm, height 0.57 mm.

First Antenna (Figure 33*e*): 1st joint with hairs and spines. 2nd joint with spines and 2 bristles (1 dorsal, 1 lateral). 3rd joint separated from 4th by weak diagonal suture; ventral margin 3rd joint short with small bristle; dorsal margin of 3rd joint with 6 spinous bristles. 4th joint with 3 bristles (1 dorsal with short marginal spines; 2 ventral). Sensory bristle of long 5th joint with stout proximal stem and 6 long distal filaments. Medial bristle of 6th joint reaching past a-claw of 7th joint. 7th joint: a-claw slender, about combined length of joints 5–8; b-bristle about ½ longer than a-claw, with 1 short and 3 long marginal filaments; c-bristle reaching well past tip of sensory bristle of 5th joint, with 4 short filaments near middle. 8th joint: d-bristle absent; e-bristle about same length as a-claw, bare with blunt tip; f-bristle longer than b-bristle, bent dorsally, with 4 marginal filaments, some with marginal spines; g-bristle about same length as c-bristle, with 4 or 5 marginal filaments. Tips of filaments and bristles of 5th joint, 7th joint (b- and c-bristles), and 8th joint (f- and g-bristles) with minute spine.

Second Antenna (Figure 33*f*): Protopodite with medial spines forming rows on distal dorsal half, and 1 small, distal, medial bristle. Endopodite: 1st joint short, bare: 2nd and 3rd joint fused, with long terminal bristle. Exopodite: elongate 1st joint with few long hairs forming distal row along inner margin; bristle of 2nd joint reaching 7th joint, with spines along ventral margin; bristles of joints 3–8 long, with natatory hairs, some with faint marginal spines; 9th joint with 3 bristles (1 long with natatory hairs, 2 short with short marginal hairs or bare); basal spines not observed; 9th joint with lateral spine about ½ length of joint; joints 3–8 with small slender spines forming row along distal margin.

Mandible (Figure 33*g–i*): Coxale endite obscure, but ventral branch with several rows of ventral spines and tip with 2 teeth; dorsal branch with 3 sets of teeth followed by undulate margin and then small main spine (Figure 33*h*); presence or absence of bristle at base of endite not determined. Basale endite with 4 end bristles, 2 triaenid bristles, and 2 dwarf bristles; ventral margin of basale with 1 minute medial bristle proximal to U-shaped depression; dorsal margin with 1 backward-pointing midbristle, 2 spinous terminal bristles, and spines forming rows extending onto lateral surface. 1st endopodial joint with 3 long spinous bristles. 2nd endopodial joint: ventral margin with 3 terminal bristles; dorsal margin with stout spinous a-, b-, c-, and d-bristles, 1 short proximal bristle, 1 short cleaning bristle between a- and b-bristles, 4 cleaning bris-

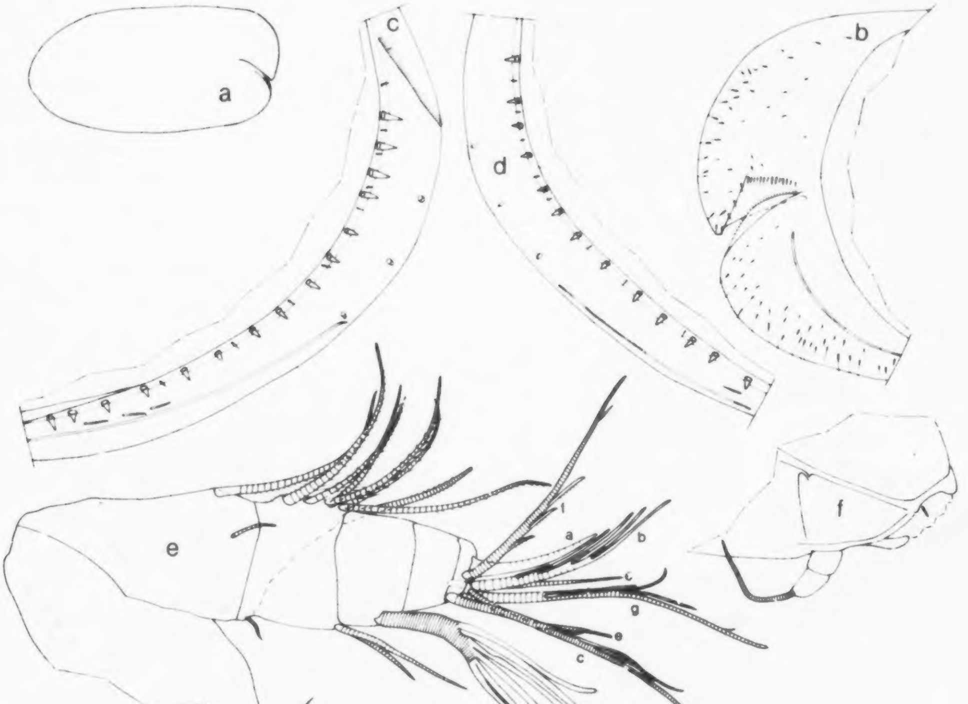

FIGURE 33.—*Synasterope williamsae,* new species, holotype, adult female, length 1.16 mm: *a,* complete specimen showing position of egg; *b,* inside view of anterior of right valve; *c, d,* inside view of posterior of right and left valves, respectively; *e,* right 1st antenna, lateral view; *f,* distal part of protopodite and endopodite of left 2nd antenna, medial view; *g,* right mandible, lateral view; *h,* coxale endite; *i,* basale and basale endite of left mandible, lateral view.

tles forming row near c-bristle (not shown on illustrated limb), 1 cleaning bristle between c- and d-bristles, 1 long, spinous, medial bristle just distal to d-bristle, and 1 long lateral bristle between c- and d-bristles; medial surface of joint with spines forming rows. End joint with dorsal claw, 1 short medial bristle, 1 long lateral bristle, and 3 very long ventral bristles. Exopodite about two-thirds length of dorsal margin of 1st endopodial joint, hirsute distally, with 2 short subterminal bristles.

Maxilla (Figure 34*a*): Epipodial appendage pointed, hirsute, reaching almost halfway along dorsal margin of basale. Endite I with 4 bristles (3 long, 1 short); endite II with 3 long bristles. Dorsal margin of basale with 1 fairly long distal bristle; medial surface with 1 proximal bristle (bristle closer to dorsal margin than to ventral margin); lateral side with 1 short proximal bristle; ventral margin with 1 proximal and 1 distal bristle and 1 long, spinous, terminal bristle. Endopodite: 1st joint with short, bare, dorsal bristle and long beta-bristle; end joint with 1 long bristle extending past beta-bristle.

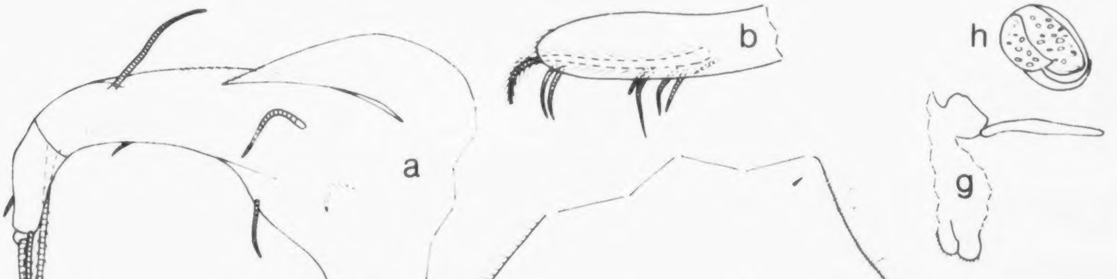

FIGURE 34.—*Synasterope williamsae*, new species, USNM 158234, holotype, adult female, length 1.16 mm: *a*, right maxilla, medial view; *b*, comb of right 5th limb, medial view; *c*, left 6th limb, medial view; *d*, 7th limb; *e*, left lamella of furca (distal part of claw 1 not shown); *f*, posterior of body showing posterior 2 claws of caudal furca; *g*, anterior of body showing medial eye and bellonci organ, and upper lip with lateral flap; *h*, right genital organ.

Fifth Limb (Figure 34*b*): Distal margin of comb with long hairs. Lateral surface of comb with long, spinous, exopodial bristle, 1 short slender bristle with base just ventral to base of long bristle, 2 pairs of bristles near middle of ventral margin, and 2 distal bristles with bases almost on ventral margin. Ventral margin of comb with alternating long and short spinous bristles (distal 3 or 4 bristles longer than others) (ventral bristles not shown on illustrated limb).

Sixth Limb (Figure 34*c*): Minute medial spine present in anterodorsal corner. Anterior margin with 2 spinous bristles (1 upper and 1 lower). Lateral sole with 1 slender hirsute bristle. Anterior tip of skirt with 4 short spinous bristles; posteroventral margin with more than 10 bristles, probably 13 or 14 (both limbs fragmented on USNM 158234).

Seventh Limb (Figure 34*d*): Proximal and distal groups each with 6 bristles (3 on each side); each bristle with 2–4 bells; opposing terminal combs each with 9 spinous teeth.

Furca (Figure 34*e*): Each lamella with 9 claws of which posterior 1 or 2 are less claw-like; posterior claw pointing backward; teeth present along posterior margins of strong claws; teeth consisting of groups of short teeth between longer teeth.

Bellonci Organ (Figure 34*g*): Elongate with rounded tip.

Eyes: Medial eye bare, unpigmented (Figure 34*g*). Lateral eyes absent.

Upper Lip (Figure 34*g*): Lip consisting of 2 hirsute lobes without spines; small hirsute flap posterior to upper lip present on each side of mouth.

Genitalia (Figure 34*h*): Consisting of oval sclerotized ring on each side of body anterior to furca.

Posterior of Body (Figure 34*f*): Obscure on USNM 158234, but with hairs; seemingly evenly rounded in dorsal corner, but presence of thumb-like process could not be ruled out.

Eggs: USNM 158234 with 1 egg in marsupium (see outline of egg in Figure 33*a*).

COMPARISONS.—The new species, *S. williamsae*, differs from *S. serrata* Poulsen, 1965, in having 6 instead of 5 bristles on the dorsal margin of the 3rd joint of the 1st antenna, in having a distal bristle on the dorsal margin of the basale of the maxilla, and in having no lateral eyes. *Synasterope williamsae* is much smaller than *S. cushmani* Kornicker, 1974, and bears only 3 instead of over 50 bristles on the infold between the broad posteroventral list and the valve margin.

Diasterope Kornicker, 1975

TYPE-SPECIES.—*Diasterope pilosa* Poulsen, 1965:347, subsequent designation by Kornicker (1975:388).

DISTRIBUTION.—Species of this genus are widespread at depths of 11–400 m (Kornicker, 1975:389).

COMPOSITION.—Two species of this genus have been reported from the study area, *D. tenuiseta* Poulsen, 1965:351, and *D. canina* Poulsen, 1965:358. Both species are known only from juvenile males.

REMARKS.—The genera *Diasterope* and *Parasterope* differ mainly on the presence or absence (respectively) of a short proximal filament on the sensory bristle of the 1st antenna of the adult female. The juvenile male of some species of *Parasterope* have a short proximal bristle that is lacking in the adult female (Bowman and Kornicker, 1967:16). Therefore, it is quite possible that when adult females are known of the 2 species referred by Poulsen to *Diasterope* they may have to be transferred to *Parasterope*. The key to species is only for species in the study area.

Key to Selected Species of *Diasterope*

Short terminal claw present on dorsal margins of mandibular basale ......
.... ***D. canina***
Two terminal bristles present on dorsal margin of mandibular basale .....
.... ***D. tenuiseta***

Diasterope tenuiseta Poulsen, 1965

Diasterope tenuiseta Poulsen, 1965:351, fig. 117.

HOLOTYPE.—Juvenile male, length 1.38 mm, Zoological Museum, Copenhagen; unique specimen.

TYPE-LOCALITY.—North of Loanga, Virgin Islands, West Indies, 30 m.

MATERIAL.—No new material.

DISTRIBUTION.—Known only from type-locality.

DIAGNOSIS.—*Mandible:* Dorsal margin of basale with 2 long terminal bristles; dorsal margin of 2nd endopodial joint with stout, claw-like c- and d-bristles (Poulsen, 1965, fig. 117e).

Maxilla: Dorsal margin of basale with 4 short bare bristles (proximal of these with base on medial surface) (Poulsen, 1965, fig. 117f).

Diasterope canina Poulsen, 1965

Diasterope canina Poulsen, 1965:358, fig. 119.

HOLOTYPE.—Juvenile male, length 1.75 mm, Zoological Museum, Copenhagen.

TYPE-LOCALITY.—St. Croix, off Buck Island, Virgin Islands, West Indies, 7 m.

MATERIAL.—No new material.

DISTRIBUTION.—Known only from type-locality.

DIAGNOSIS.—Mandible: Dorsal margin of basale with short tooth in place of lateral terminal bristle (Poulsen, 1965, fig. 119g).

Bruuniella Poulsen, 1965

TYPE-SPECIES.—*Bruuniella breviata* Poulsen, 1965:323, by monotypy.

DISTRIBUTION.—The type-species *B. breviata* was collected in the vicinity of Thailand (Poulsen, 1965:323). A species left in open nomenclature as *Bruuniella* species A was described from Bermuda (Kornicker, 1981b:12). A new species described herein is from Martha's Vineyard, Massachusetts. Known depth range of the genus is 0.6–2 m.

COMPOSITION.—Two species are in the study area, *Bruuniella* species A and *B. hazeli*, new species.

Key to the Species of *Bruuniella*

1. Sixth limb with about 18 ventral bristles . . . . ***B. breviata***
   Sixth limb with none or 1 ventral bristle 2
2. Sensory bristle of 5th joint of 1st antenna of females and juveniles with 6 long terminal filaments . . . . ***Bruuniella*** **species A**
   Sensory bristle of 5th joint of 1st antenna of females and juveniles with 2 short filaments followed by 4 long terminal filaments . . . . ***B. hazeli*, new species**

Bruuniella species A

Bruuniella species A.—Kornicker, 1981a:12, figs. 9, 10.

MATERIAL.—No new material examined.

DISTRIBUTION.—Smith's Sound, Governor's Island, Bermuda; depth about 0.6 m.

DIAGNOSIS.—Carapace with dorsal margin having much greater curvature than ventral margin.

First antenna: Sensory bristle of 5th joint with 6 long terminal bristles.

REMARKS.—Species left in open nomenclature because of inadequate material.

Bruuniella hazeli, new species

FIGURES 35, 36

ETYMOLOGY.—The species is named for Dr. Joseph E. Hazel.

HOLOTYPE.—USNM 152849, 1 ovigerous female on slides and in alcohol.

TYPE-LOCALITY.—Station 9, Vineyard Haven Harbor, Martha's Vineyard, Massachusetts.

Distribution.—Known only from type-locality.

Description of female (Figures 35, 36).—Carapace elongate in lateral view, greatest height at the middle (Figure 35*a*); dorsal margin broadly convex, ventral margin linear; posterior evenly rounded; incisur wide, inner end at valve midheight.

Infold: Behind rostrum with 7 bristles forming row parallel to anterodorsal margin, 1 distal bristle on list, and 4 bristles forming row between list and incisur (Figure 35*c*); 1 short bristle present near inner end of incisur; anteroventral infold with 10 bristles forming row; about 7 bristles along ventral infold to point opposite lowermost, hyaline, flap-like bristle on posterior list. List beginning near inner margin of anterior part of infold extending along ventral infold and becoming broader on posterior infold; broad posterior list with about 8 transparent bristles (Figure 35*d*), 1 or 2 short bristles between each pair of transparent bristles (total of about 10 short bristles); about 6 short bristles and 3 or 4 faint processes between broad posterior list and posterior margin of valve.

Size: USNM 152849, holotype, length 0.79 mm, height 0.44 mm.

First Antenna (Figure 35*e*): 1st joint bare; 2nd joint relatively short for subfamily, with 1 spinous, dorsal, terminal bristle, long hairs forming few distal rows on medial surface, and short spines forming distal rows on lateral surface; 3rd, 4th, and 5th joints fused; ventral margin with 2 spinous proximal bristles and few long proximal hairs; dorsal margin with 9 bristles (1 proximal and 1 distal spinous bristle, 4 spinous claw-like bristles with bases on lateral side, and 3 slender spinous bristles with bases on medial side); sensory bristle of 5th joint with 2 short subterminal filaments and 4 long terminal filaments; medial side of 6th joint and distal part of 4th-5th joints with abundant short spines near dorsal margin; short medial bristle of 6th joint with base near ventral margin. Seventh joint: a-bristle claw-like with proximal teeth on dorsal margin; b-bristle about one-third longer than a-bristle, with 2 short proximal filaments and 4 longer distal filaments including stem; c-bristle about twice length of a-bristle, with 7 filaments including stem. Eighth joint: d-bristle absent, e-bristle same length as a-bristle; f-bristle bent dorsally, with 5 filaments including stem; g-bristle slightly longer than a-bristle, with 4 filaments including stem.

Second Antenna: Protopodite bare. Endopodite 2-jointed (Figure 35*f*): 1st joint short bare, 2nd joint with long terminal bristle. Exopodite: bristle of 2nd joint reaching past 9th joint, with short marginal hairs; joints 2–8 with natatory bristles with faint ventral spines; 9th joint with 3 bristles (1 long, 1 medium, 1 short; long bristle with natatory hairs, others not seen clearly); basal spines absent.

Mandible (Figure 36*a–c*): Coxale endite faint; ventral branch may be broken off specimen examined, but lobe with 4 minute bristles in its place, 1 or 2 minute bristles proximal to lobe (Figure 36*a*). Basale: endite with 2 short, pectinate, end bristles and 3 slender, bare, proximal bristles; medial surface with long hairs, ventral margin bare; dorsal margin with 2 spinous terminal bristles. Exopodite about ½ length of dorsal margin of 1st endopodite joint, hirsute, with 2 terminal bristles almost reaching end of 2nd endopodite joint. Endopodite: 1st joint short, with 3 long, spinous, ventral bristles: medial of these shorter than others and with abundant short spines, others with long proximal and short distal spines; 2nd and 3rd endopodial joints fused, with 3 stout claws (middle of these with broader base than others, distal claw longer than others and with base on lateral side and with short ventral and dorsal spines), and 10 bristles (1 minute dorsal bristle proximal and lateral to proximal dorsal claw, 1 bristle about same length as middle claw with base ventral and lateral to middle claw, 1 bristle about same length as middle claw with base medial to distal claw, 1 long bristle with base on lateral side between dorsal and middle claws; 1 short bristle with base medial to distal claw, 4 long bristles ventral to distal claw, and 1 minute medial bristle between proximal and middle dorsal claws).

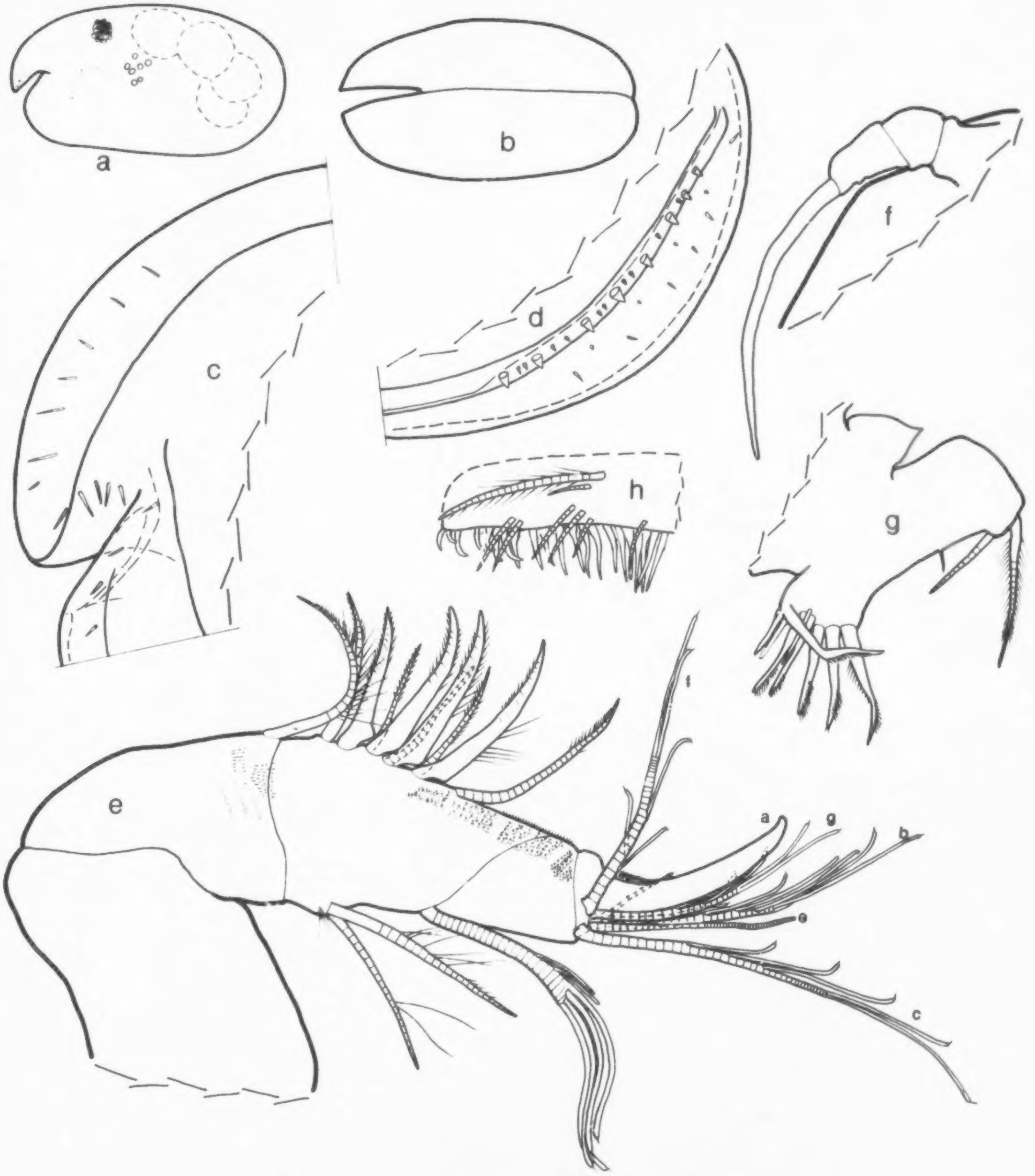

FIGURE 35.—*Bruuniella hazeli*, new species, USNM 152849, holotype, adult female, length 0.79 mm: *a*, lateral view of complete specimen showing left lateral eye, central adductor muscle attachments, position of 4 eggs, and brownish color pattern (stippled); *b*, dorsal view of carapace (valves slightly open and tilted toward right slightly); *c*, inside view of anterior of right valve; *d*, inside view of posterior of right valve; *e*, right 1st antenna, lateral view; *f*, endopodite of right 2nd antenna, medial view; *g*, left maxilla, medial view; *h*, comb of left 5th limb, lateral view (dashed line represents proximate dorsal margin of comb, which was folded on limb).

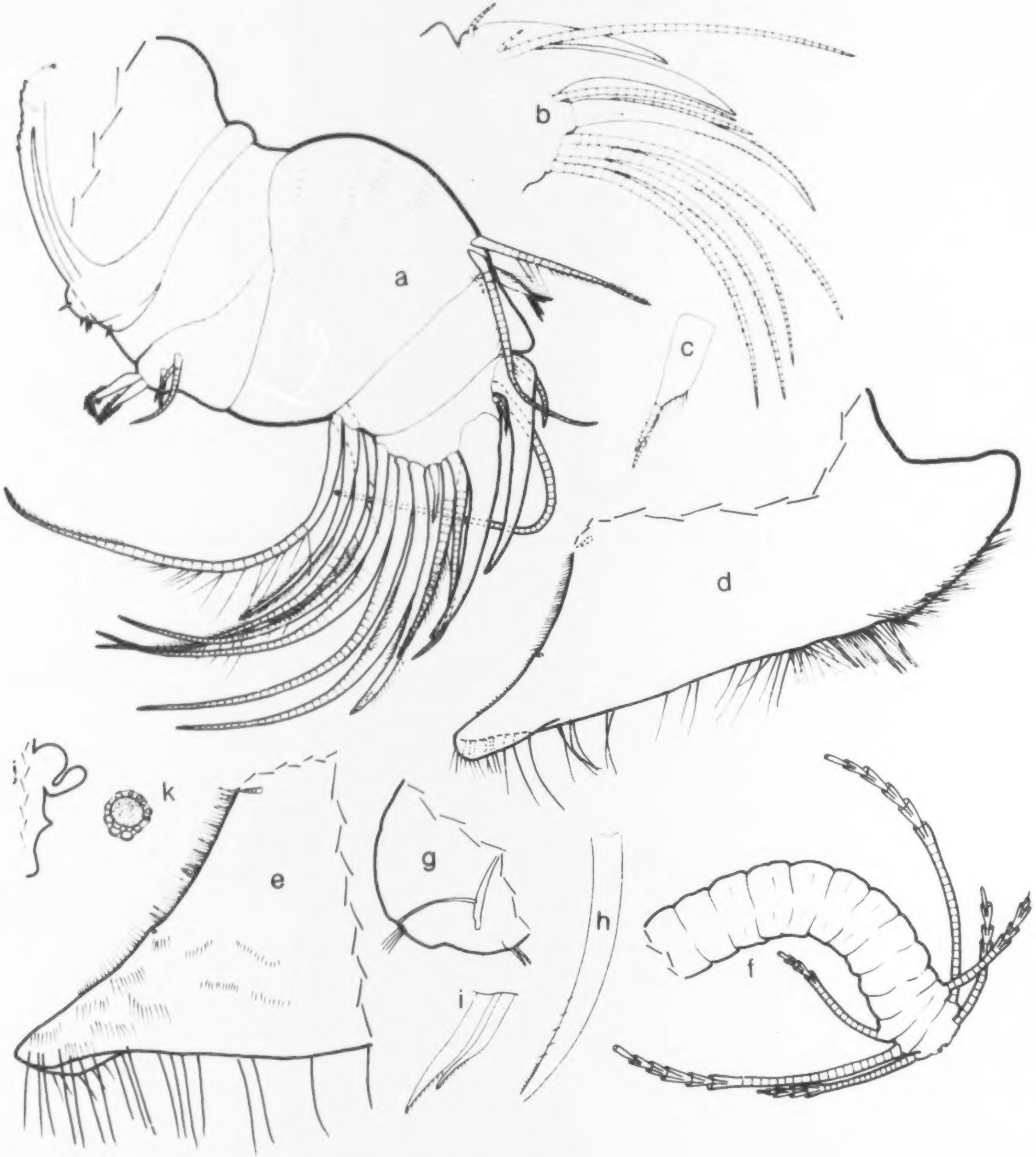

FIGURE 36.—*Bruuniella hazeli*, new species, USNM 152849, holotype, adult female, length 0.79 mm: *a*, left mandible, medial view; *b*, 3rd endopodial joint of right mandible, lateral view; *c*, exopodite of right mandible, lateral view; *d*, left 6th limb, lateral view; *e*, anterior part of right 6th limb, medial view; *f*, 7th limb; *g*, posterior of body showing posterior 2 claws of furca, right Y-sclerite and girdle, and posterior hairs; *h*, claw 1 or 2 of furca (separated from lamella during dissection); *i*, 2 posterior claws of furcal lamella; *j*, medial eye and bellonci organ; *k*, right lateral eye.

Maxilla (Figure 35*g*): Epipodite short, triangular, bare; endite I with 2 long and 1 short bristle; endite II with 3 long bristles; ventral margin of basale with 1 short midbristle and 1 long terminal bristle; endopodite obscure on appendage examined, with 1 long, spinous, terminal bristle.

Fifth Limb (Figure 35*h*): Comb with 1 long, spinous, exopodial bristle with 1 minute bristle ventral to its base; about 5 minute exopodial bristles near ventral margin.

Sixth Limb (Figure 36*d*): Anterior and posterior margins concave; medial side with 1 short, bristle-like spine in anterior proximal corner and 1 shorter, bristle-like spine near middle of anterior margin; ventral margin with stiff long hairs but no bristles; short spines forming rows near middle of medial side; long hairs along ventral margin, and on medial side near anterior and posterior margins.

Seventh Limb (Figure 36*f*): Limb with 6 distal bristles, each with 3–5 bells; terminus consisting of minute opposing combs; exact number of comb teeth could not be ascertained.

Furca (Figure 36*g–i*): Small furca fragmented on specimen, with about 7 or 8 claws; distal claws long, curved, proximal shorter claws tending to be straight; minute spines or teeth along posterior margins.

Bellonci Organ (Figure 36*j*): Broadening anteriorly with rounded tip.

Eyes: Medial eye well developed, bare (Figure 36*j*). Lateral eyes slightly larger than medial eye, pigmented, with many ommatidia (Figure 36*k*).

Posterior of body (Figure 36*g*): Tuft of long hairs present at midposterior margin, but no dorsal process.

Eggs: Holotype with 8 eggs.

COMPARISONS.—The new species, *B. hazeli*, differs from *Bruuniella breviata* Poulsen, 1965, in many characters, but mainly in not having any ventral bristles on the 6th limb, and in having on the sensory bristle of the 5th joint of the 1st antenna 2 short proximal and 4 long terminal filaments. In the last character, the new species also differs from *Bruuniella* species A described from Bermuda (Kornicker, 1981b:12), which has 6 long terminal filaments on the sensory bristle.

Prionotoleberis Kornicker, 1974

TYPE-SPECIES.—*Prionotoleberis gyion* Kornicker, 1974b:43.

DISTRIBUTION.—Mediterranean Sea; off Mauritania, West Africa; off Florida, Gulf of Mexico. Known depth range 2–238 m.

COMPOSITION.—This genus is represented in the study area by 1 species, *P. salomani*, new species.

Prionotoleberis salomani, new species

FIGURES 37–40

ETYMOLOGY.—The species is named for Carl H. Saloman who collected some of the specimens upon which the species is based.

HOLOTYPE.—USNM 157840, adult female on slides and in alcohol.

TYPE-LOCALITY.—Station 30, Panama City, Florida, depth 9.1 m.

ALLOTYPE.—USNM 157696, station 4, Panama City Florida, depth 12.8 m.

PARATYPES.—Anclote Anchorage, Florida: USNM 156961, ovigerous female, grab sample 32, replicate 3; USNM 157126, adult female, grab sample 24, replicate 3.

DISTRIBUTION.—Gulf coast of Florida; depth range 2–12.8 m.

DESCRIPTION OF ADULT FEMALE (Figures 37, 38).—Carapace elongate with dorsal and ventral margins parallel; anterior and posterior ends evenly rounded (Figure 37*a*).

Infold: Obscure in USNM 156961; rostral and anteroventral infold with numerous bristles; posteroventral infold with broad flap-like bristles along list and about 4 processes between list and posteroventral corner of valve (Figure 37*b*).

Size: USNM 156961, length 1.81 mm, height 0.65 mm; USNM 157840, length 1.98 mm, height 0.75 mm; USNM 157126, length 1.72 mm, height 0.63 mm.

First Antenna (Figure 37*c,d*): 1st joint with medial spines. 2nd joint with medial spines and

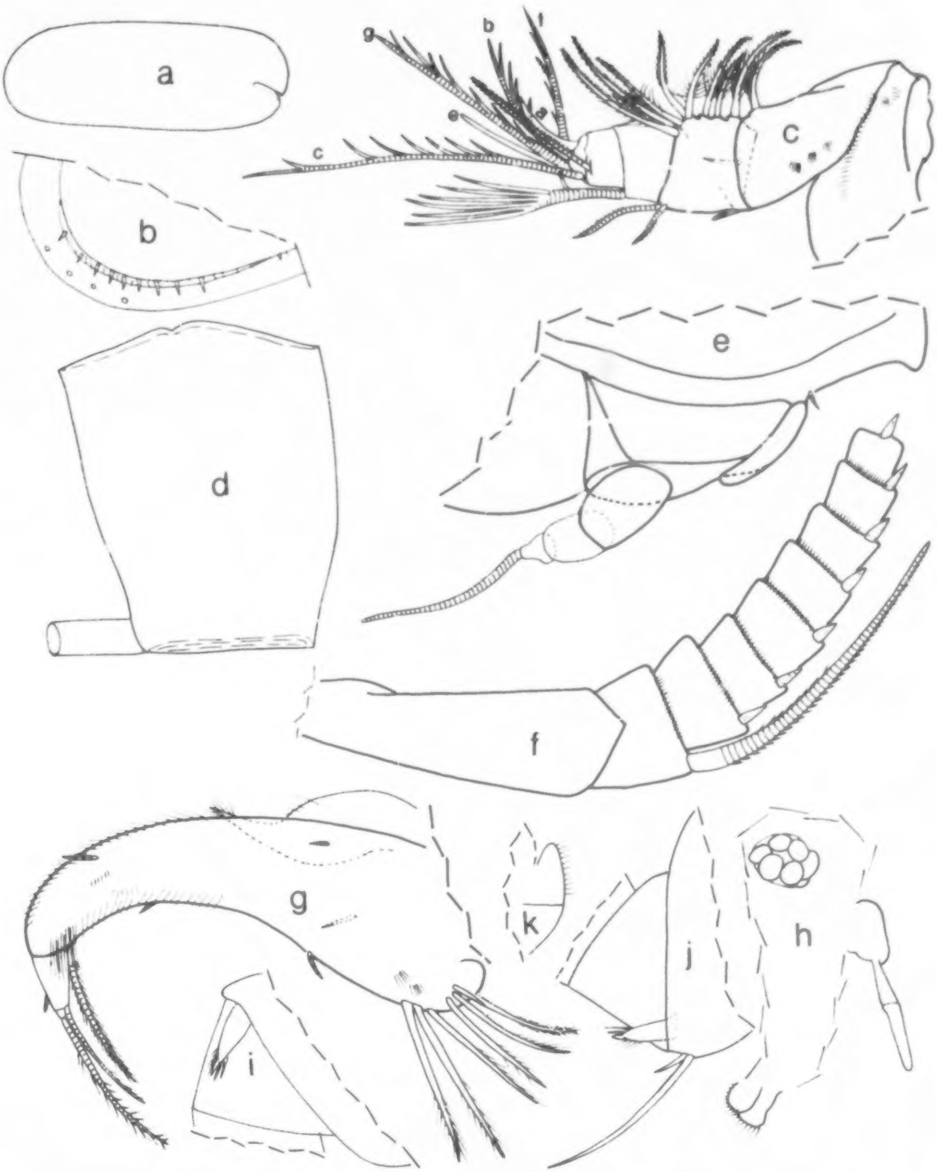

FIGURE 37.—*Prionotoleberis salomani*, new species, USNM 156961, paratype, adult female, length 1.81 mm: *a*, lateral view of complete specimen showing lateral eye; *b*, inside view of posterior of left valve showing processes posterior to list; *c*, right 1st antenna, medial view; *d*, 5th joint of left 1st antenna, lateral view; *e*, endopodite and distal part of protopodite of left 2nd antenna, medial view; *f*, exopodite of left 2nd antenna, lateral view; *g*, right maxilla, medial view; *h*, anterior of body showing right lateral eye, medial eye and bellonci organ, and upper lip with lateral flap. USNM 157126, paratype, adult female, length 1.72 mm: *i*, exopodite of left mandible, lateral view; *j*, exopodite and distal dorsal bristles of basale of right mandible, lateral view; *k*, small dorsal process on posterior of body, anterior to left.

2 bristles (1 lateral, 1 dorsal). 3rd and 4th joints fused, quadrate, with no separating suture except near ventral margin; 3rd joint with 1 small ventral bristle and 6–8 spinous dorsal bristles (USNM 157840 with 6, USNM 156961 with 7–8, latter possibly aberrant); 4th joint with 2 spinous, terminal, ventral bristles and 1 long, spinous, dorsal bristle. 5th joint with convex, slightly undulate, dorsal margin (Figure 37*d*); sensory bristle with 1 small proximal filament and 6 long terminal filaments. 6th joint minute, with long, spinous, medial bristle. 7th joint: a-claw smooth, shorter than medial bristle of 6th joint; b-bristle longer than bristle of 6th joint, with 1 proximal filament and 3 long, distal, marginal filaments; c-bristle about twice length of b-bristle, with 7 marginal filaments. 8th joint: d-bristle represented by minute peg; e-bristle bare with blunt tip, shorter than b-bristle; f-bristle slightly longer than b-bristle, with 4 or 5 short ventral filaments, some with marginal spines; g-bristle longer than f-bristle, with about 7 short dorsal filaments.

Second Antenna (Figure 37*e,f*): Protopodite with minute distal medial bristle, otherwise bare. Endopodite 3-jointed: 1st and 2nd joints bare, 3rd joint small, with long terminal filament with blunt tip. Exopodite: bristle of 2nd joint not reaching 9th exopodial joint, spinous; bristles of joints 3–8 long with natatory hairs, bristles of joints 3–6 also with ventral spines near middle; 9th joint with 4 bristles (2 short with short marginal spines, 2 long with natatory hairs); joints 3–8 with basal spines; 9th joint with lateral spine; joints 2–8 with short spines forming row along distal margin.

Mandible (Figures 37*i,j* 38*a*): Coxale endite broken off on both limbs of USNM 156961 (see description of adult male). Basale: Endite with 4 end bristles, 3 triaenid bristles (with 3 or 4 pairs of marginal teeth excluding terminal pair), 1 pair of dwarf bristles, and minute glandular peg; medial side of basale with either no bristles or 1 small bristle near endite; dorsal margin with 2 terminal bristles (1 long, 1 minute). 1st endopodial joint with 3 long, spinous, ventral bristles. 2nd endopodial joint: dorsal margin with 1 small proximal bristle and stout, spinous, a-, b-, c-, and d-bristles; ventral margin with 3 spinous terminal bristles; medial surface with spines and total of 9 cleaning bristles, and 1 long spinous bristle just distal to d-bristle; lateral side with 1 long spinous bristle between c- and d-bristles. 3rd endopodial joint with stout dorsal claw with distal dorsal spines, and 5 bristles (4 long, 1 short). Exopodite hirsute, 40–50 % length of dorsal margin of 1st endopodial joint, with 2 small subterminal bristles.

Maxilla (Figure 37*g*): Endite I with 4 bristles (3 long, 1 short); endite II with 3 long bristles. Epipodial appendage hirsute, reaching to about middle of dorsal margin of basale. Basale: hirsute medial surface with 0 or 1 short proximal bristle and 1 short distal bristle, all near dorsal margin; ventral margin with 2 short bristles (1 proximal, 1 distal) and 1 long, spinous, terminal bristle; lateral surface with 1 short proximal bristle. Endopodite: 1st joint with small faint anterior bristle, and beta-bristle just reaching past tip of long terminal bristle on ventral margin of basale; 2nd joint with long, spinous, terminal bristle.

Fifth Limb (Figure 38*b*): Exopodial bristles of comb consisting of stout spinous bristle extending past tip of comb, 2 small slender bristles just ventral to base of stout bristle, and 2 pairs of bristles near ventral margin. 1 additional bristle ventral to the proximal pair of bristles also may be epipodial bristle; 2 single bristles present near ventral margin at distal end of comb; tips of bristles along ventral margin of comb with flaring marginal hairs.

Sixth Limb (Figure 38*c*): Anterior margin with upper and lower sutures, each with single spinous bristle; lateral flap with hirsute margin and single spinous bristle at anterior tip; ventral margin of skirt with 5 bristles (with long marginal spines) followed by short space in vicinity of lateral flap and then 26 spinous bristles.

Seventh Limb (Figure 38*d*): Each limb with 6 proximal bristles (3 on each side) and 6 distal bristles (3 on each side); each bristle with up to 4 bells. Terminus consisting of opposing combs,

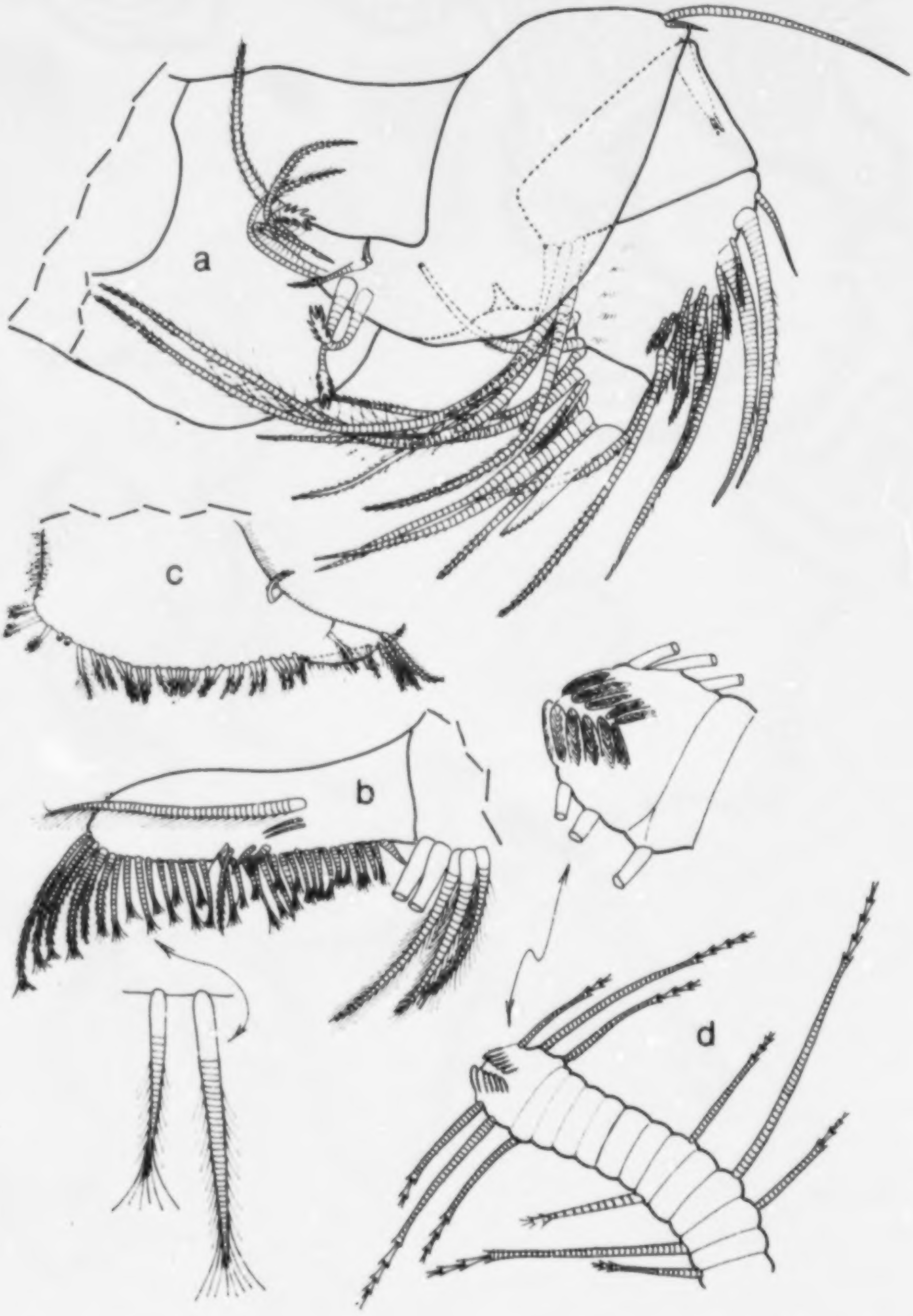

FIGURE 38.—*Prionotoleberis salomani*, new species USNM 156961, paratype, adult female, length 1.81 mm: *a*, left mandible, medial view; *b*, left 5th limb, lateral view; *c*, left 6th limb, medial view; *d*, 7th limb.

each with about 12 spinous teeth.

Furca: Each lamella with 9 slender claws decreasing in length posteriorly along lamella.

Bellonci Organ (Figure 37*h*): Elongate with suture near middle and rounded tip.

Eyes: Lateral eye pigmented brown, with about 10 ommatidia (Figure 37*h*). Medial eye unpigmented, bare, about same size as lateral eye (Figure 37*h*).

Lips (Figure 37*h*): Upper lip consisting of hirsute lobe on each side of middle saddle. Lower lip with lateral hirsute flaps.

Posterior of Body (Figure 37*k*): With small, spinous, thumb-like, dorsal process.

Y-Sclerite: Typical for subfamily.

Eggs: USNM 156961 with 3 eggs in marsupium.

DESCRIPTION OF ADULT MALE (Figures 39, 40).—Carapace elongate with hairs forming vertical row near posterior margin (Figure 39*a*).

Infold: Not examined.

Size: USNM 157696, length 1.84 mm, height 0.76 mm.

First Antenna (Figure 39*b*): 1st joint bare. 2nd joint with 2 spinous bristles (1 dorsal, 1 lateral). 3rd joint separated from 4th with strong suture on medial side but none on lateral side except near ventral and dorsal margins; 3rd joint with 1 small ventral bristle and 6 longer, spinous, dorsal bristles. 4th joint with 2 short, ventral, terminal bristles and 1 longer, spinous, dorsal bristle. 5th and 6th joints fused; dorsal margin of 5th joint undulate and with proximal projection; sensory bristle stout, with stem reaching just past 8th joint, and with numerous filaments. 6th joint with short medial bristle with base near ventral margin. 7th joint: a-claw not reaching past tip of bristle of 6th joint, with faint ventral teeth near tip; b-bristle about twice length of a-claw, with 5 marginal filaments; c-bristle extremely long (tip missing on limb examined), with 36 marginal filaments on remaining part. 8th joint: d-bristle represented by minute peg; e-bristle slightly longer than b-bristle, bare with blunt tip; f-bristle extremely long (tip missing on limb examined, with 37 filaments on remaining part): g-bristle about one-third longer than b-bristle, with 8 marginal filaments.

Second Antenna (Figure 39*c,d*): Protopodite with small, distal, medial bristle, otherwise bare. Endopodite 3-jointed: 1st joint bare; 2nd joint elongate with 3 short, distal, ventral bristles, 3rd joint reflexed, fairly short, with 1 proximal ventral bristle and minute teeth forming rows along inner margin, tip pointed. Exopodite: 1st joint elongate, with distal hairs; 2nd joint elongate, joints 3–9 short; joints 2–8 with long hairs on inner distal corner, and spines along distal margin; joints 4–8 with small basal spines; 9th joint with small lateral spines; bristles of joints 2–8 with natatory hairs but no ventral spines; 9th joint with 4 bristles (3 long, 1 short) with natatory hairs.

Mandible (Figure 40*a,b*): Coxale endite: ventral branch with 4 or 5 oblique rows of spines and tip with 3 minute teeth; ventral margin of dorsal branch with 5 or 6 knobs and short main spine; distal dorsal bristle of dorsal branch hirsute and with base proximal to base of terminal spine; dorsal margin of branch serrate; minute medial bristle present near base of ventral branch. Basale: endite with 4 short end bristles, 3 weakly developed triaenid bristles, and 1 dwarf bristle; a minute bristle present near base of endite; dorsal margin of basale with 2 terminal bristles (lateral of these more than twice length of other). Exopodite ⅓ length of dorsal margin of 1st endopodial joint, hirsute, with 2 small subterminal bristles. 1st endopodial joint with 3 long, spinous, ventral bristles. 2nd endopodial joint: ventral margin with 3 spinous terminal bristles; dorsal margin with 2 short proximal bristles and stout a-, b-, c-, and d-bristles; medial surface spinous, with about 16 cleaning bristles and 1 long, stout, spinous bristle just distal to base of d-bristle; lateral surface with long bristle between c- and d-bristle. 3rd endopodial joint with stout dorsal claw, 1 short bristle, and 4 long bristles.

Maxilla (Figure 39*e*): Similar to that of adult female except short ventral bristles of basale not observed.

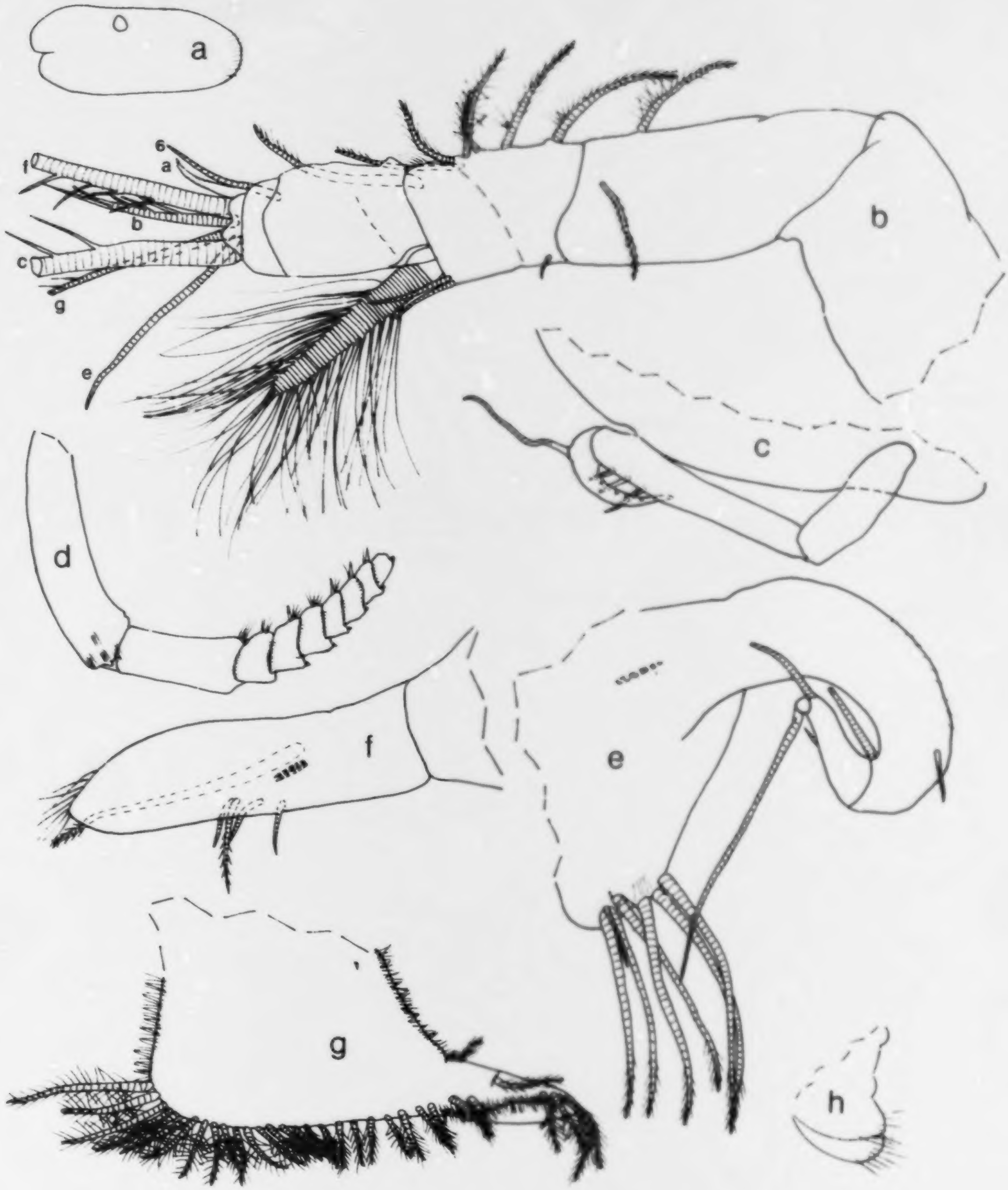

FIGURE 39.—*Prionotoleberis salomani*, new species, USNM 157696, allotype, adult male, length 1.84 mm: *a*, lateral view of complete specimen showing lateral eye and posterior hairs; *b*, left 1st antenna, lateral view (only proximal part of some bristles of 7th and 8th joints illustrated); *c*, endopodite of left 2nd antenna, medial view; *d*, exopodite of 2nd antenna; *e*, left maxilla, medial view (epipodial appendage not shown); *f*, comb of right 5th limb, medial view; *g*, left 6th limb, medial view; *h*, anterior lobes of upper lip.

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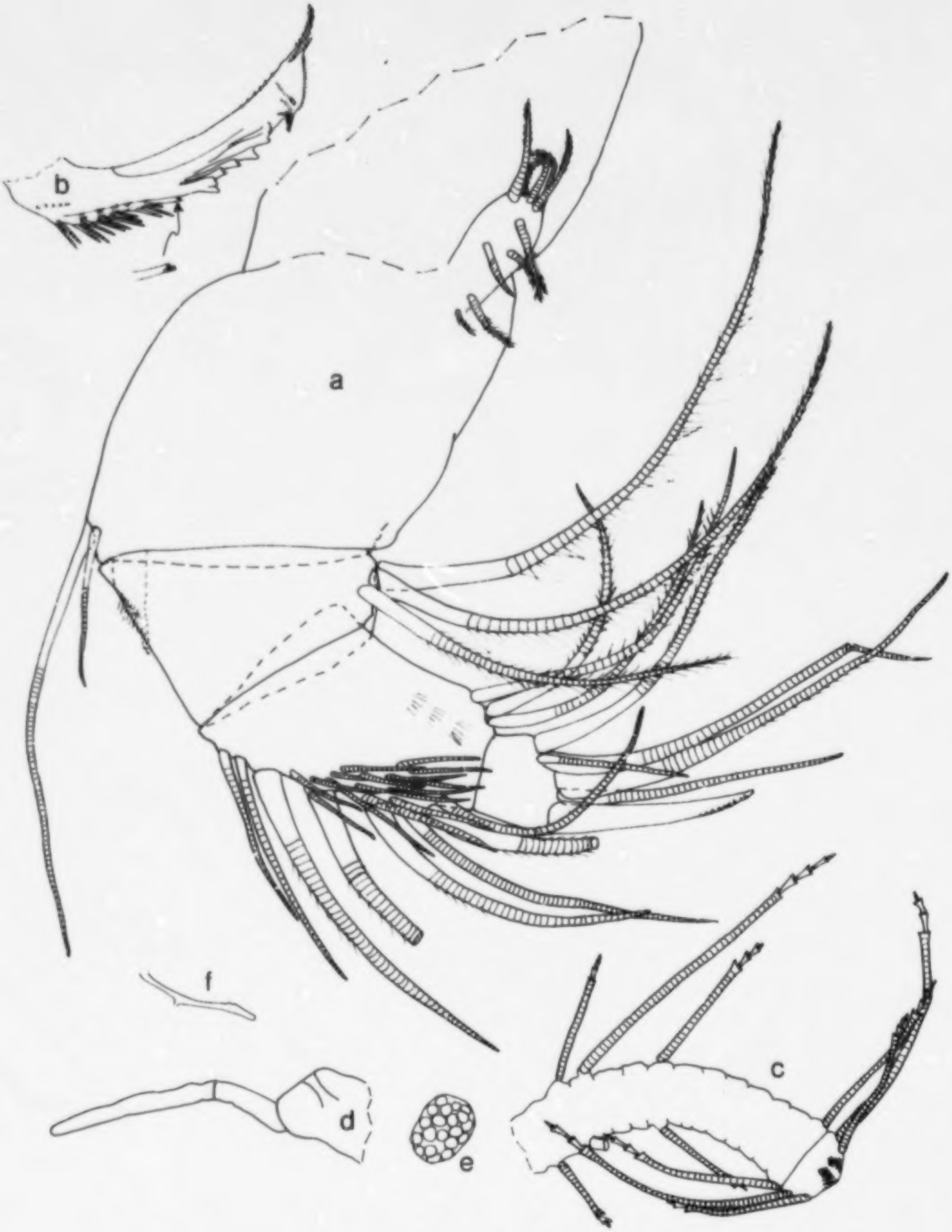

FIGURE 40.—*Prionotoleberis salomani*, new species, USNM 157696, allotype, adult male, length 1.84 mm: *a*, right mandible, medial view; *b*, coxale endite of left mandible, lateral view; *c*, 7th limb; *d*, medial eye and bellonci organ; *e*, lateral eye; *f*, left Y-sclerite, anterior to left.

Fifth Limb (Figure 39*f*): Similar to that of adult female.

Sixth Limb (Figure 39*g*): Similar to that of adult female except with minute medial bristle near proximal anterior corner of stem, and ventral margin of skirt of USNM 157696 with 31 bristles on left limb and 37 on right limb.

Seventh Limb (Figure 40*c*): Similar to that of adult female except one of the limbs of USNM 157696 with only 5 proximal bristles (3 on the side, 2 on other; other limb with 6 proximal bristles).

Furca: Each lamella with 7 or 8 claws; posterior set of claws bristle-like, others claw-like; anterior 4 claws on each lamella more strongly curved than those of female.

Bellonci Organ (Figure 40*d*): Similar to that of adult female.

Eyes: Medial eye unpigmented, bare (Figure 40*d*). Lateral eyes pigmented brown, about ⅓ larger than medial eye, each with about 20 ommatidia (Figure 40*e*).

Lips (Figure 39*h*): Similar to that of adult female.

Copulatory Organ: Small, consisting of several lobes.

Posteror of Body: Thumb-like dorsal process not observed.

Y-Sclerite (Figure 40*f*): Similar to that of adult female.

COMPARISONS.—The very short bristle in the terminal pair on the dorsal margin of the mandibular basale of the female clearly identifies this species.

Postasterope, new genus

ETYMOLOGY.—The generic name is from the Latin *post* ("after, behind") plus *asterope*, in reference to the construction of the posterior infold of members of this genus. Gender feminine.

TYPE-SPECIES.—*Postasterope abaco*, new species.

DISTRIBUTION.—Florida, Bahamas, West Indies, California, 1–401.4 m.

COMPOSITION.—The new genus *Postasterope* is proposed for 4 species (2 new): *Postasterope corrugata* (Poulsen, 1965:391), *P. messingi*, new species, *P., abaco*, new species, and *P. barnesi* (Baker, 1978:139).

DIAGNOSIS OF GENUS.—Carapace elongate with linear or slightly convex ventral and dorsal margins.

Infold and Selvage (Figures 41*d,e*, 43*b,c*): Each valve with narrow list near inner edge of infold extending from point near inner end of incisur to posterior end of ventral margin where it broadens and bears faint, transparent, flap-like bristles that continue along the inner edge of the posterior list (the bristles often difficult to resolve). A broad shelf with linear posterior edge extending posteriorly from posterior list forms basis for proposing the genus *Postasterope*. Posterior edge of shelf generally serrate or spinous, especially on left valve where spines or serrations may be quite long (Figures 41*d,e*, 43*b,c*). On some species shelf being thin, transparent, and relatively wide (Figure 41*e*); on other species transparent part of shelf narrow or absent (Figure 43*c*). On right valve only, ventral end of shelf continuing ventrally as ridge curving anteriorly and forming flange medial to ventral margin of valve (Figures 41*d*, 43*b*). Selvage with wide lamella prolongation with smooth outer edge intersecting ventral margin of valve near anterior end then continuing posteriorly dorsal to ventral margin and ending at ventral edge of posterior shelf (Figures 41*d,e*, 43*b,c*) (the precise relationship between posterior end of selvage and shelf not clear, but serrated edge of shelf may be equivalent to edge of lamellar prolongation of selvage). On some species 2 or 3 elongate processes project posteriorly from underneath shelf (Figures 41*d*, 43*b,c*). Some shelves with small bristles (whether these are on or below shelf usually difficult to resolve). On left valve only, ventral end of shelf not continuing ventrally as ridge but either ending at posterior end of selvage (Figure 41*e*) or vaguely curving posteriorly to intersect valve margin (Figure 43*c*). Posterior shelves may bear closely spaced pore canals (Figure 41*e*). (The linear posterior edge

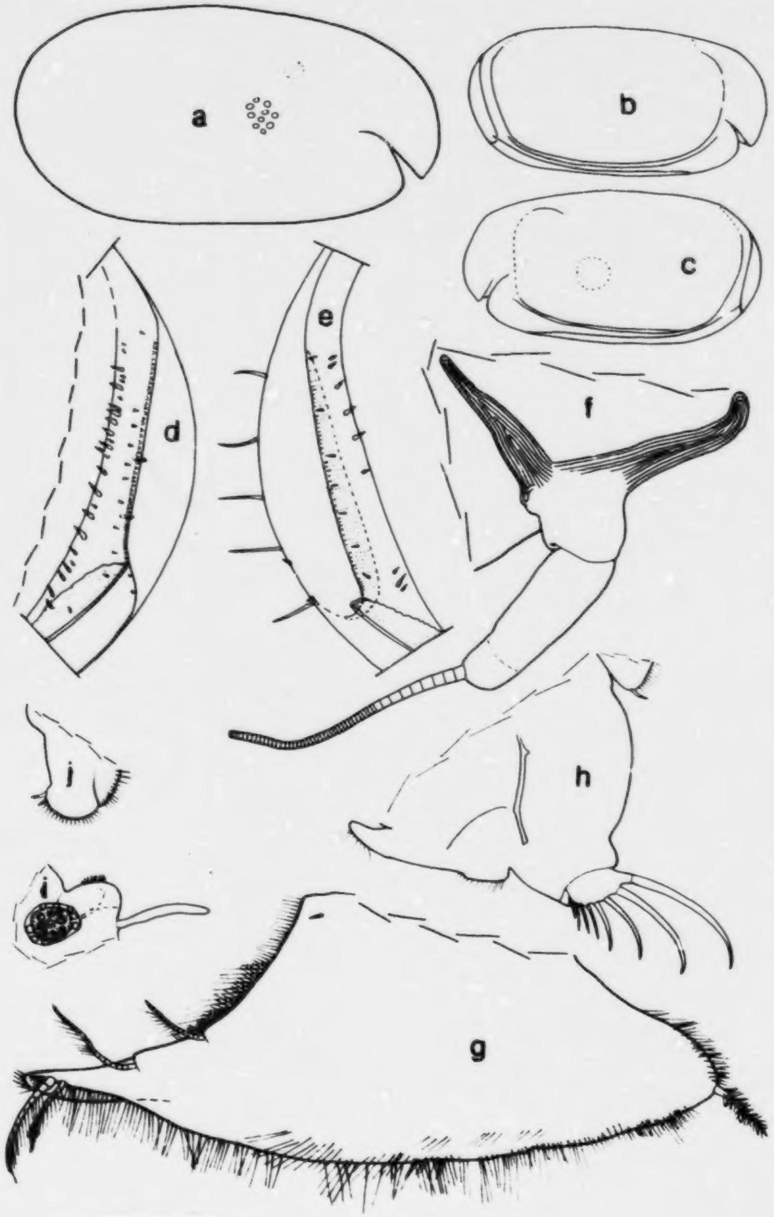

FIGURE 41.—*Postasterope messingi*, new species, USNM 156715, holotype, adult female, length 1.16 mm: *a*, lateral view of complete specimen showing lateral eye (stippled) and central adductor muscle attachments; *b*, *c*, inside view of left and right valves, respectively, (bristles of infold not shown); *d*, *e*, inside views of posterior of right and left valves, respectively; *f*, endopodite of left 2nd antenna, medial view; *g*, right 6th limb, medial view; *h*, posterior of body showing right lamella of furca, thumb-like dorsal process, right Y-sclerite, and posterior corner of right 6th limb (to upper right); *i*, right lateral eye, medial eye and bellonci organ; *j*, upper lip with lateral process, anterior to left.

of the shelf of both valves, and the curved ridge at the ventral end of the shelf of the right valve are generally visible through the valves when viewed externally, enabling the recognition of the genus without opening valves.)

First Antenna: 2nd joint without lateral bristle. Dorsal margin of 3rd joint with 6 bristles. Dorsal margin of 5th and 6th joints of adult male with distinct protuberances. Sensory bristle of 5th joint of female with 6 terminal filaments and no short proximal filament. The c- and f-bristles of adult male extremely long. The e-bristle well developed but d-bristle absent or minute on both sexes.

Second Antenna: Endopodite of male 3-jointed with 3rd joint reflexed on 2nd.

Mandible: Exopodite ½ to ¾ length of dorsal margin of 1st endopodial joint. Long lateral bristle present between b- and c-bristles of dorsal margin of 2nd endopodial joint.

Sixth Limb: Ventral margin of skirt with 0–2 bristles near middle, 0–2 bristles on posterior corner, and 2 or 3 bristles at anterior end; no bristles present on lateral anterior flap.

Posterior of Body: Known species with posterodorsal thumb-like process with spines or hairs at tip.

COMPARISONS.—The new genus *Postasterope* differs from most other genera of Cylindroleberidinae in having a broad shelf on the posterior list of each valve, usually with a serrate or spinose posterior edge (spines larger on left valve), and the shelf on the right valve continues along the ventral margin of the valve as a flange medial to the valve edge. Members of the genus *Skogsbergiella* (Kornicker, 1975:465) have a ridge within the posterior edge of the right valve but members of that genus have well-developed d- and e-bristles on the 1st antenna, whereas the d-bristle is absent or minute on members of *Postasterope*. Some species of *Synasterope* have a carapace like that of *Postasterope*, but members of that genus do not have a long lateral bristle between the b- and c-bristles of the 2nd endopodial joint of the mandible.

Key to the Species of *Postasterope*

1. Ventral margin of mandibular basale without bristle . . . . ***P. barnesi***
   Ventral margin of mandibular basale with simple bristle . . ***P. corrugata***
   Ventral margin of mandibular basale with triaenid bristle 2
2. Carapace longer than 1.4 mm; endite I of maxilla with 3 bristles (2 long, 1 short) . . . . ***P. abaco***, new species
   Carapace shorter than 1.3 mm; endite I of maxilla with 4 bristles (3 long, 1 short) . . . . ***P. messingi***, new species

Postasterope corrugata (Poulsen, 1965), new combination

Parasterope corrugata Poulsen, 1965:391, figs. 129, 130.

HOLOTYPE.—Mature male, length 1.46 mm, Zoological Museum, Copenhagen.

TYPE-LOCALITY.—Virgin Islands, West Indies (Poulsen, 1965:391).

MATERIAL EXAMINED.—None.

DISTRIBUTION.—Virgin Islands, West Indies, shallow water (10–20 m) (Poulsen, 1965:395).

DIAGNOSIS (based on description and illustrations of Poulsen, 1965).—Both left and right valves with narrow strip (transparent?) forming shelf along posterior edge of list on posterior part of infold; posterior edge of shelf of left valve with 70–80 slender spines, that of right valve finely serrate or almost smooth (see Poulsen, 1965, fig. 129c, c′, c″). Length of mature males 1.30–1.56 mm, female unknown.

Mandible: Coxale with no bristle at basis of endite; ventral margin of basale with 1 short bare bristle; longer of 2 bristles of dorsal margin of basale reaching to near middle of dorsal margin of 1st endopodial joint, length of shorter bristle 80 percent that of longer bristle; exopodite almost ¾ length of dorsal margin of 1st endopodial joint.

Maxilla: Slender distal part of epipodite and dorsal margin of basale without hairs; basale without proximal dorsal bristle (this bristle on other species of the Cylindroleberidinae typically with base on medial surface); beta-bristle of 1st endopodial joint almost as long as bare bristle of 2nd endopodial joint.

Copulatory Limbs: Very large, as long as furca, including claws.

REMARKS.—Poulsen (1965:391) reported from the same sample as the holotype a juvenile male having a length of 1.2 mm. In a paragraph headed "*Development*," Poulsen (p. 395) briefly described a male 1.20 mm long present in one of the samples. I assume this to be the juvenile male mentioned on page 391 because it is the only specimen having that length listed on the page. Poulsen's description, except possibly for the fewer bristles on the 7th limb, indicates that the specimen is an adult male, either an aberrant specimen of *P. corrugata*, or perhaps a different species.

***Postasterope messingi*, new species**

FIGURES 41–44

ETYMOLOGY.—The species is named for one of its collectors, Dr. Charles G. Messing.

HOLOTYPE.—USNM 156715, 1 ovigerous female on slide and in alcohol.

TYPE-LOCALITY.—Key Biscayne side of Bear Cut, Florida Keys, 2–4 m.

NON-TYPES.—USNM 158386, 158390, 158389, 157894, 4 adult males; USNM 158604, 11 adult males. All from Abaco Island, Bahamas.

DISTRIBUTION.—Key Biscayne, Florida; Abaco Island, Bahamas. Known depth range 2–4 m.

DESCRIPTION OF ADULT FEMALE (Figures 41, 42). Carapace elongate with evenly rounded anterior and posterior margins and only slightly convex ventral and dorsal margins (Figure 41*a–c*); deep incisur below middle of anterior margin.

Ornamentation: Surface smooth with sparsely distributed long bristles.

Infold (Figure 41*d,e*): Infold of incisur ventral to rostral ridge with about 9 small bristles forming row; rostral infold with about 21 bristles forming row just within valve edge, and about 25 bristles (mostly small) posterior to row of bristles near edge; anteroventral infold with about 3 bristles. Ventral infold with 2 lists joining at their posterior ends to form broad posterior list; bare upper list extending from near inner end of incisur to inner edge of ventral end of wide posterior list; lower list with wide lamellar prolongation (stippled in Figure 41*d,e*); anterior end of lower list intersecting valve edge near anterior end of ventral margin; posterior end of lower list joining outer edge of wide posterior list at its ventral end. Ventral infold with few bristles between upper and lower lists; posterior list with very faint, transparent, flap-like bristle and few simple bristles near inner edge; outer edge of posterior list with minute spine-like processes on or near edge (difficult to resolve with × 40 objective); a few small bristles present proximal to posterior edge of posterior list; outer edge of posterior list continues ventrally intersecting lower edge of valve.

Central Adductor Muscle Attachments (Figure 41*a*): Consisting of about 10 individual oval scars.

Size: USNM 156715, length 1.16 mm, height 0.61 mm.

First Antenna (Figure 42*a*): 1st joint spinous. 2nd joint with medial spines and 1 spinous dorsal bristle. 3rd and 4th joints forming square; joints separated by suture on lateral side; 3rd joint with minute ventral bristle and 6 spinous dorsal bristles; 4th joint with stout, spinous, dorsal bristle, 2 slender ventral bristles, and slightly concave distal margin. Sensory bristle of 5th joint with 6 long terminal filaments. Medial bristle of 6th joint long, spinous. 7th joint: a-claw short, stout, bare; b-bristle stout, about twice length of a-claw,

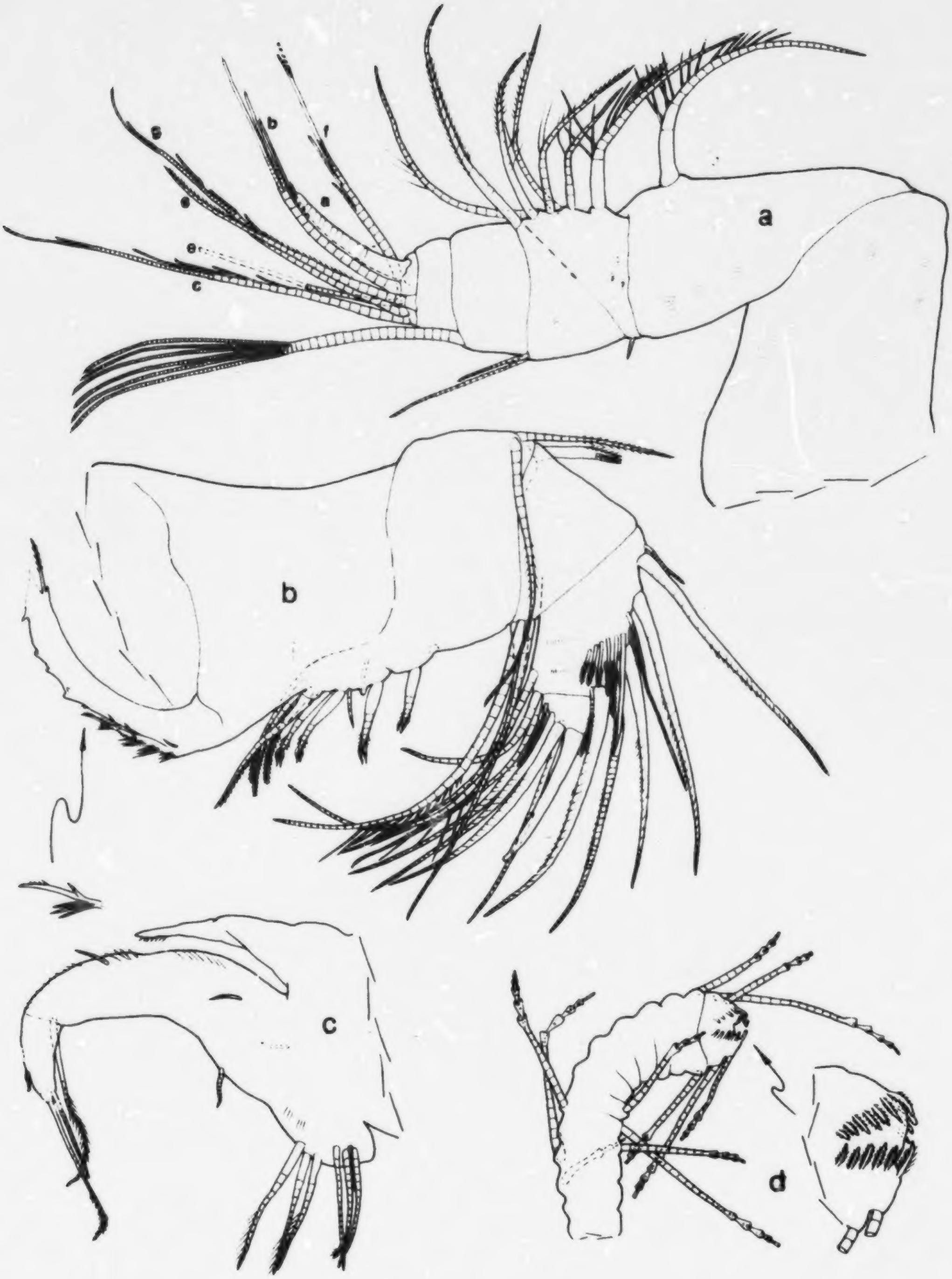

Figure 42.—*Postasterope messingi*, new species, USNM 156715, holotype, adult female, length 1.16 mm: *a*, right antenna, medial view; *b*, left mandible, medial view; *c*, right maxilla, medial view; *d*, 7th limb.

with 3 long marginal filaments near middle; c-bristle about 3 times length of a-claw, slightly longer than sensory bristle of 5th limb, with 5 short marginal filaments. 8th joint: d-bristle absent; e-bristle bare, slightly shorter than b-bristle, tip blunt; f-bristle bent dorsally, about same length as b-bristle, with 3 or 4 short marginal filaments; g-bristle slightly shorter than c-bristle, with 6 short marginal filaments.

Second Antenna (Figure 41*f*): Protopodite: short spines forming rows along dorsal margin and dorsal half of medial surface; distal medial bristle minute. Endopodite 3-jointed: suture between 2nd and 3rd joints weak; 1st and 2nd joints bare; 3rd joint with long terminal bristle with blunt tip. Exopodite: distal medial bristle of 1st joint not observed, if present extremely small; bristle of 2nd joint extending past 9th joint, with ventral spines; bristles of joints 3–8 long, with natatory hairs and minute, widely spaced, ventral spines; 9th joint with 3 bristles (1 short, bare, 1 medium with natatory hairs, 1 long with natatory hairs and few ventral spines); basal spines fairly small (spine on 8th joint about ¾ length of 9th joint); lateral spine of 9th joint about same length as basal spine of 8th joint.

Mandible (Figure 42*b*): Coxale endite: minute medial bristle present at base of ventral branch; ventral branch with spines forming 4 oblique rows, and with pointed tip with few short spines; ventral margin of dorsal branch with 4 low nodes followed by short main spine (tip of branch obscure on limbs examined); long bristle on dorsal margin of branch set well back from tip of branch. Basale: endite with 4 spinous end bristles, 3 trianeid bristles (with 3 pairs of marginal teeth excluding terminal pair), 1 dwarf bristle, and glandular peg; ventral margin of basale with 1 triaenid bristle near endite; dorsal margin with 2 terminal bristles (lateral of these about ½ length of other). Exopodite hirsute, about ¾ length of dorsal margin of 1st endopodial joint, with 2 subterminal bristles. 1st endopodial joint with 3 long, spinous, ventral bristles. 2nd endopodial joint: ventral margin with 3 long spinous bristles; dorsal margin with 1 short proximal bristle and stout, spinous, a-, b-, c-, and d-bristles; medial side with 7 cleaning bristles between b- and c-bristles (1 individual bristle and 6 bristles forming row), and 1 short spinous bristle just distal to the d-bristle; lateral side with 1 long bristle between b- and c-bristles and c- and d-bristles. 3rd joint with stout dorsal claw and 5 spinous bristles (4 long, 1 short).

Maxilla (Figure 42*c*): Epipodial appendage hirsute, with slender tip reaching just past middle of dorsal margin of basale. Endite I with 4 bristles (3 long and 1 short); endite II with 3 long bristles. Basale: dorsal margin with 1 short distal bristle; medial side with 1 short proximal bristle; ventral margin with 1 short proximal bristle and 1 long, spinous, terminal bristle; lateral side with 1 short proximal bristle. Endopodite: 1st joint with short anterior bristle and long beta-bristle; end joint with long, spinous, terminal bristle.

Fifth Limb: Not clearly observed on specimen examined, but seemingly typical for genus.

Sixth Limb (Figure 41*g*): Medial side with small spine in proximal anterior corner; anterior margin with upper and lower bristle; anteroventral corner of skirt with 2 short hirsute bristles; ventral margin without bristles; posterior corner with 1 short hirsute bristle; narrow lateral flap without bristles; hairs present along anterior end of lateral flap and along anterior, ventral, and posterior margins of remaining part of limb.

Seventh Limb (Figure 42*d*): Each limb with 6 proximal bristles (3 on each side) and 6 terminal bristles (3 on each side); each bristle with 3 or 4 distal bells. Terminus consisting of opposing combs, each with about 15 spinous teeth.

Furca (Figure 41*h*): Each lamella with 8 or 9 claws; posterior 2 or 3 claws tending to be bristle-like, but not bent backwards on specimen examined; teeth present along posterior margins of most claws.

Bellonci Organ (Figure 41*i*): Elongate without suture, tip rounded.

Eyes: Medial eye hirsute, pigmented (Figure 41*i*). Lateral eyes about same size as medial eye, each with black pigment and about 17 ommatidia (Figure 41*i*).

Lips (Figure 41*j*): Upper lip consisting of 2 hirsute lobes, each with 2 anterior spines. Lower lip with hirsute lateral flap on each side of mouth.

Posterior of Body (Figure 41*h*): With spinous, thumb-like, dorsal process.

Y-Sclerite: Normal for subfamily.

Eggs: USNM 156715 with 10 eggs in marsupium.

DESCRIPTION OF ADULT MALE (Figures 43, 44).—Carapace elongate with overhanging rostrum (Figure 43*a,f*); bristles forming vertical row near posterior end of valve.

Infold (Figure 43*b,c*): In general, similar to that of female.

Size: USNM 158386, length 1.16 mm, height 0.97 mm; USNM 158390, length 1.23 mm, height 0.64 mm; USNM 157894, length 1.19 mm, height 0.60 mm; USNM 158389, length 1.16 mm, height 0.60 mm; USNM 158604 (11 specimens, 2 measured) length 1.13 mm, height 0.55 mm, length 1.18 mm, height 0.59 mm.

First Antenna (Figure 44*a*): 1st joint bare. 2nd joint with small lateral spines and long medial hairs near ventral margin, and 1 spinous dorsal bristle. 3rd joint with small bristle on short ventral margin, and 6 spinous bristles on long dorsal margin. Dorsal margin of 4th joint with stout spinous bristle; ventral margin with few short spines and 2 terminal bristles; 5th joint short, with well-defined sutures separating the 5th and 6th joints; sensory bristle with abundant filaments, terminal filaments stouter than others; dorsal edge of 5th joint with 2 processes (proximal process longer than other). 6th joint: medial bristle spinous, with base near dorsal margin; dorsal margin with 4 low processes. 7th joint: a-claw short, bare, on pedestal; b-bristle with 2 short proximal filaments with few marginal spines, and 3 longer distal filaments, bristle more than twice length of a-claw; c-bristle very long, tip broken off on specimen examined, 15 filaments on remaining part. 8th joint: d-bristle missing; e-bristle reaching past a-claw, bare with blunt tip; f-bristle very long, tip broken off on specimen examined, 17 filaments on remaining part; g-bristle longer than b-bristle, with about 7 filaments.

Second Antenna: Protopodite bare except for small, medial, distal bristle (Figure 43*g*): endopodite 3-jointed (Figure 43*h*): 1st joint elongate, bare; 2nd joint elongate with 3 distal ventral bristles (distal of these about ½ length of others); 3rd joint elongate, reflexed on 2nd, and with 1 long proximal bristle with blunt tip; tip of joint pointed and with ridges. Exopodite: joint 1 elongate with distal lateral hairs forming rows; 2nd joint about 2½ times as long as 3rd joint; remaining joints decreasing gradually in size; joints 3–8 with minute basal spines; 9th joint with small, pointed, lateral spine about ⅓ length of joint; bristle of 2nd joint with few, faint, ventral spines and natatory hairs; bristles of joints 3–8 with long bristles with natatory hairs, no spines; 9th joint with 4 bristles (1 short, 3 long), all with natatory hairs; joints 2–8 with minute spines forming row along distal margin and long hairs forming row on distal dorsal corner.

Mandible (Figure 44*b,c*): Coxale endite with small medial bristle at base of ventral branch; ventral branch with spines in 4 oblique rows, and tapered tip; dorsal branch with 4 processes along ventral margin proximal to small main spine; tip of branch pointed; dorsal margin with bristle (broken on illustrated endite) set back from tip and few serrations (Figure 44*c*). Basale endite with 4 end-type bristles, 3 triaenid bristles with 4 or 5 paired spines excluding terminal pair, 1 dwarf bristle, and a glandular peg. Basale: dorsal margin with 2 long terminal bristles; ventral margin with 1 small triaenid bristle with 3 or 4 paired spines excluding terminal pair; U-shaped sclerotized process to which muscle is attached present just distal to base of small triaenid bristle. Exopodite short, reaching to about middle of dorsal margin of 1st endopodial joint, hirsute, with 2 small subterminal bristles. 1st endopodial joint with 3 long spinous bristles. 2nd endopodial joint: ventral margin with 3 terminal spinous bristles; dorsal margin with 2 proximal bristles, bare a-bristle, and spinous b-, c-, and d-bristles; lateral side with a long bristle between b- and c-

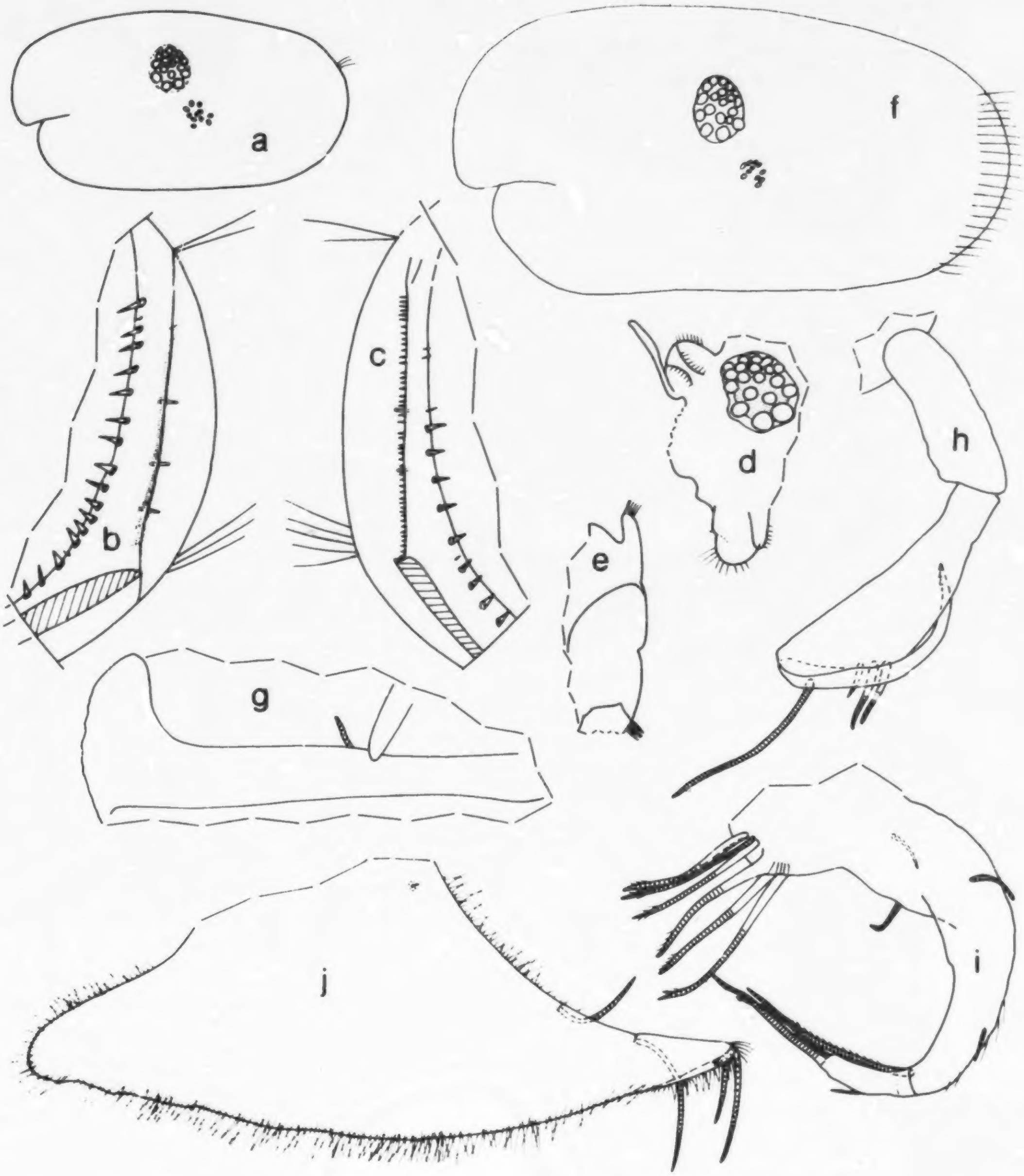

FIGURE 43.—*Postasterope messingi*, new species, USNM 158386, non-type, adult male, length 1.16 mm: *a*, lateral view of complete specimen; *b*, *c*, inside views of posterior of right and left valves, respectively; *d*, anterior of body showing left lateral eye, medial eye and bellonci organ, and upper lip with lateral flap. USNM 158390, non-type, adult male, length 1.23 mm: *e*, posterior of body showing thumb-like dorsal process and 4 posterior claws of furca. USNM 157894, non-type, adult male, length 1.19 mm: *f*, lateral view of complete specimen showing left lateral eye, central adductor muscle attachments, and posterior hairs; *g*, distal bristle of protopodite of left 2nd antenna, medial view; *h*, endopodite of left 2nd antenna, medial view; *i*, left maxilla, medial view; *j*, right 6th limb, lateral view.

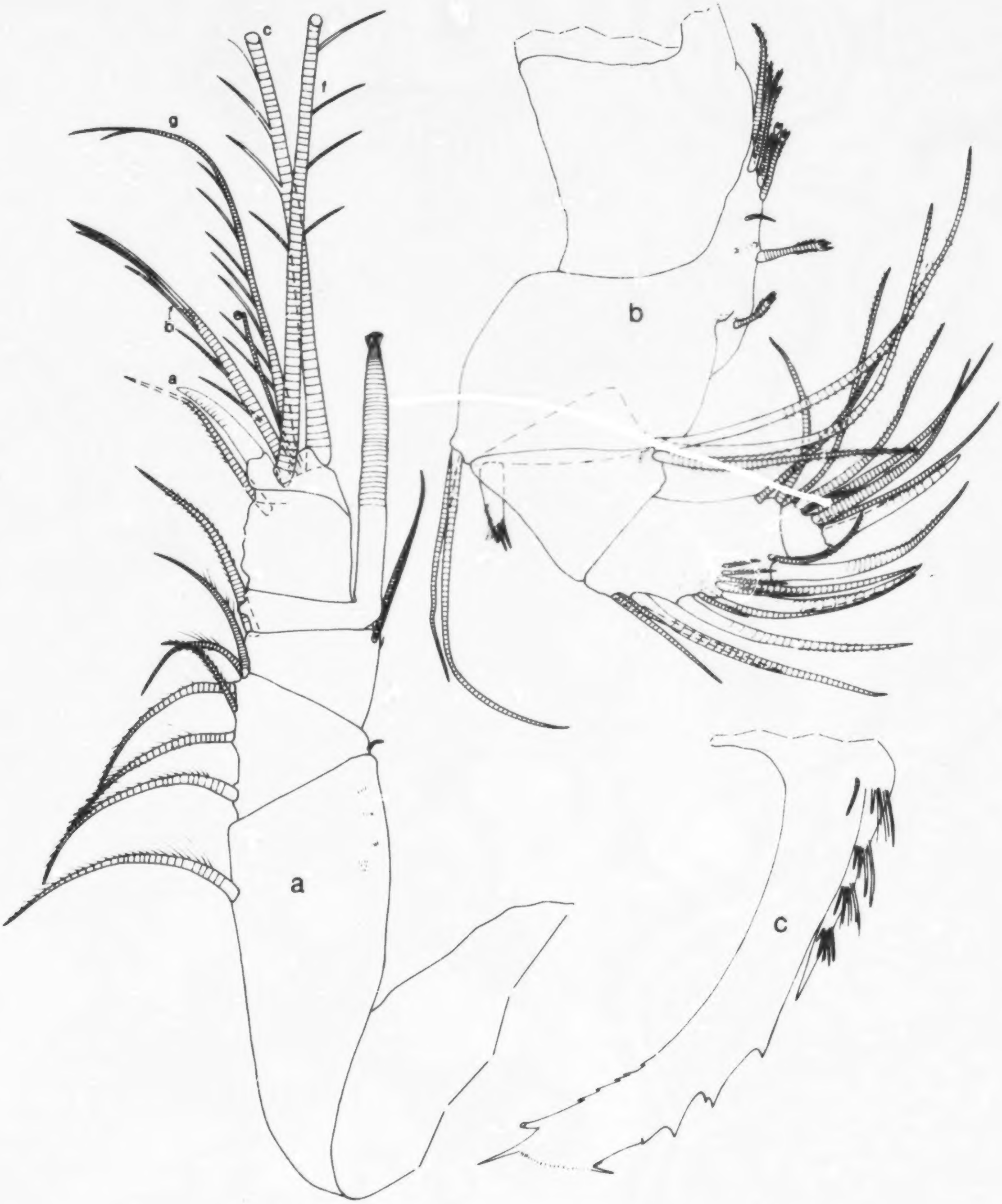

FIGURE 44.—*Postasterope messingi*, new species, USNM 157894, non-type, adult male, length 1.19 mm: *a*, right 1st antenna, lateral view; *b*, right mandible, medial view; *c*, coxale endite of left mandible, medial view.

bristles and another between c- and d-bristles; medial side with spines forming rows, 5 cleaning bristles (1 just distal to base of b-bristle, 4 forming row just proximal to base of c-bristle), and 1 spinous bristle adjacent to base of d-bristle. End joint with straight claw with ventral teeth, and 5 bristles (medial of these short).

Maxilla (Figure 43*i*): Epipodial appendage with hirsute tip reaching to about middle of dorsal margin of basale. Endite I with 4 bristles (3 long, 1 short); endite II with 3 long bristles. Basale: dorsal margin hirsute, with 1 proximal and 1 distal bristle (both with medial bases); ventral margin with 1 proximal bristle and 1 long, spinous, terminal bristle; lateral side with 1 short proximal bristle. 1st endopodial joint with 1 short anterior bristle and 1 long beta-bristle; end joint with terminal bristle about ⅓ longer than beta-bristle.

Fifth Limb: Obscure on specimen examined but typical for genus.

Sixth Limb (Figure 43*j*): Small medial spine in anterior proximal corner; anterior margin with 1 bristle at both upper and lower sutures (lower bristle much longer than upper bristle); anterior corner of skirt with 2 bristles (posterior of these about ¾ length of other); lateral flap hirsute but without bristles; ventral margin of skirt hirsute but without bristles; posteroventral corner of skirt with no or 1 bristle.

Seventh Limb: Each limb with 6 bristles in proximal group (3 on each side) and 6 in distal group (3 on each side); each bristle with 3 or 4 bells. Terminus with opposing combs, each with about 9 spinous teeth.

Furca (Figure 43*e*): Each lamella with 8 claws; posterior 2 or 3 claws bristle-like but not oriented backwards.

Bellonci Organ (Figure 43*d*): Elongate, broadening near middle, with rounded tip.

Eyes: Medial eye unpigmented, with dorsal hairs (Figure 43*d*). Lateral eye larger than medial eye, amber color, with 20 ommatidia (Figure 43*d*). (Lateral eye was probably black prior to preservation.)

Upper Lip (Figure 43*d*): Each lobe hirsute but without spines; anterior spine on saddle between lobes; hirsute lateral flap on each side of mouth.

Copulatory Organ: Fairly small, consisting of several lobes, at least 1 with bristles.

Posterior of Body (Figure 43*e*): With short, hirsute, thumb-like process.

Y-Sclerite: Typical for subfamily.

COMPARISONS.—The new species *P. messingi* differs from *P. barnesi* and *P. corrugata* in having a triaenid bristle on the ventral margin of the mandibular basale, and also in having a smaller carapace. The carapace is also smaller than that of *P. abaco*, which also differs in having 3 instead of 4 bristles on endite I of the maxilla.

REMARKS.—The adult males are designated non-types because it is uncertain that they are the same species as the female holotype. They were not collected together, and the male differs from the female in not having medial spines on the protopodite of the 2nd antenna, and in the morphology of the posterior infold of the left valve. The list on the posterior infold of the left valve of the female forms a broad transparent shelf; the shelf is not transparent on the male; also, the posterior spines along the edge of the posterior list of the male are not evident on the female (compare Figure 43*b* with Figure 41*e*). Because the overall similarity of the males and the female, and because some of the differences noted above could be the result of sexual dimorphism, I find it expedient to refer the males to the same species as the female. The lateral eyes of the male are without pigment but I believe that to be an artifact resulting from preservation.

Postasterope abaco, new species

FIGURES 45, 46

ETYMOLOGY.—The specific name from the island near which the holotype was collected.

HOLOTYPE.—USNM 158388, adult male, partly dissected, in alcohol.

TYPE-LOCALITY.—Abaco Island, Bahamas.

PARATYPE.—USNM 158387, 1 adult male;

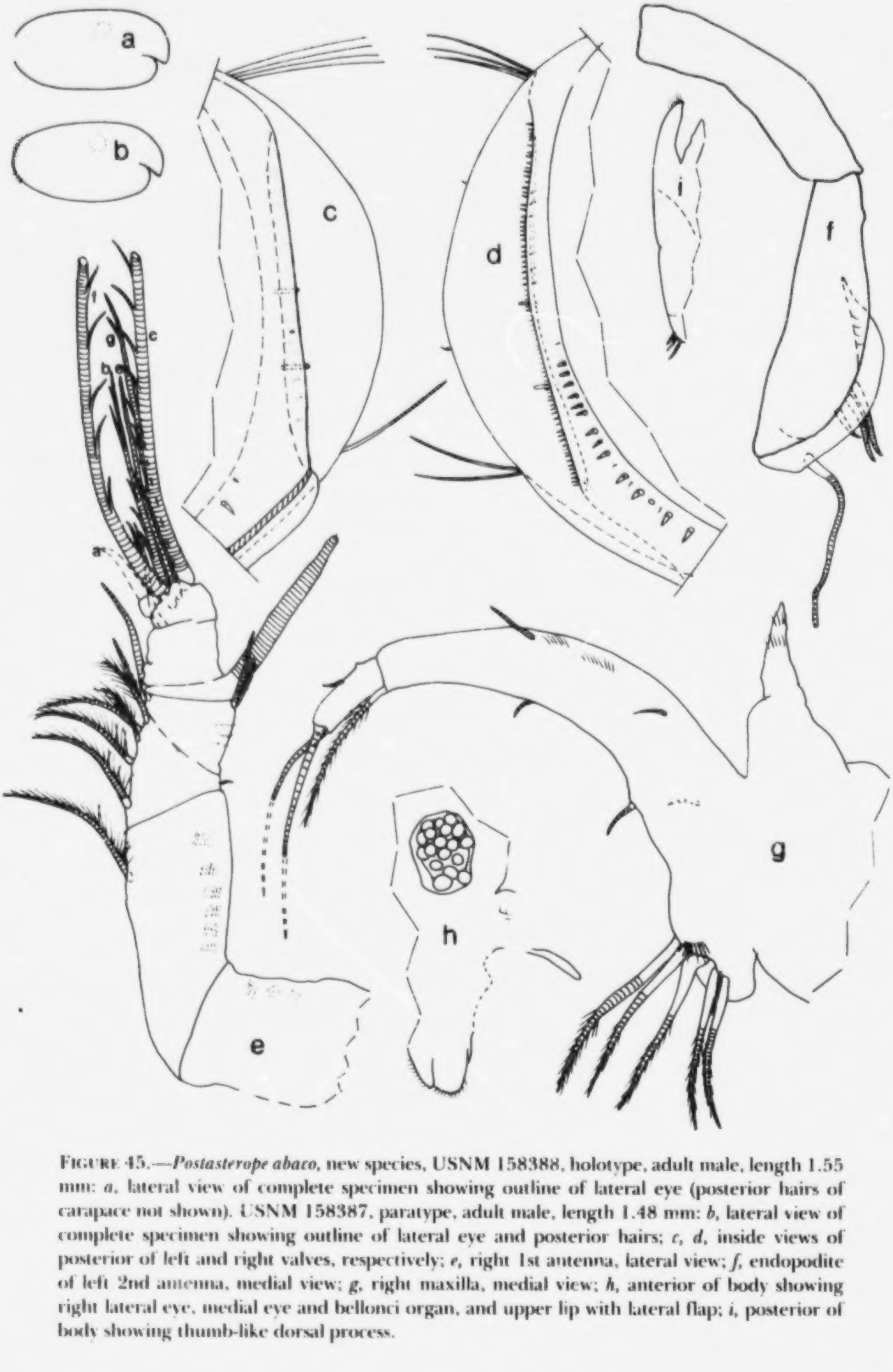

FIGURE 45.—*Postasterope abaco,* new species, USNM 158388, holotype, adult male, length 1.55 mm: *a,* lateral view of complete specimen showing outline of lateral eye (posterior hairs of carapace not shown). USNM 158387, paratype, adult male, length 1.48 mm: *b,* lateral view of complete specimen showing outline of lateral eye and posterior hairs; *c, d,* inside views of posterior of left and right valves, respectively; *e,* right 1st antenna, lateral view; *f,* endopodite of left 2nd antenna, medial view; *g,* right maxilla, medial view; *h,* anterior of body showing right lateral eye, medial eye and bellonci organ, and upper lip with lateral flap; *i,* posterior of body showing thumb-like dorsal process.

USNM 158602, 8 adult males, all from same sample as holotype.

DISTRIBUTION.—Known only from type-locality.

DESCRIPTION OF ADULT MALE (Figures 45, 46).—Carapace elongate, only slightly narrower posteriorly in lateral view (Figure 45*a,b*): bristles forming vertical row near posterior end of valves.

Infold (Figure 45*c,d*): Similar in construction to that of *Parasterope corrugata* Poulsen, 1965:391, and *Synasterope setisparsa* illustrated herein.

Size: USNM 158387, length 1.48 mm, height 0.76 mm; USNM 158388, length 1.55 mm, height 0.81 mm. USNM 158602 (3 specimens measured): length 1.50 mm, height 0.74 mm, length 1.52 mm, height 0.76 mm, length 1.49 mm, height 0.75 mm.

First Antenna (Figure 45*e*): 1st joint with medial spines forming rows. 2nd joint with medial spines forming rows near ventral margin, and 1 spinous dorsal bristle; lateral bristle absent. Suture between 3rd and 4th joints better defined on medial than on lateral surface; 3rd joint with small bristle on short ventral margin, and 6 spinous bristles on long dorsal margin; 4th joint with minute spines forming rows on lateral surface near ventral margin, 2 terminal ventral bristles, and 1 long, spinous, dorsal bristle. Short 5th joint with stout sensory bristle with abundant filaments (terminal filaments stouter than others). 6th joint with undulate dorsal margin having 2 prominent proximal processes; medial bristle of 6th joint spinous, with base near dorsal margin. 7th joint: a-claw with few spines along ventral margin and few faint teeth on medial surface (a-claw missing on illustrated limb, but shown as dashed outline of claw on opposite limb); b-bristle with 5 or 6 marginal filaments, some with spines; c-bristle very long, with about 27 marginal filaments. 8th joint: d-bristle absent; e-bristle about same length as b-bristle, bare with blunt tip; f-bristle about same length as c-bristle, with about 25 ventral filaments; g-bristle longer than b-bristle, with 8 marginal filaments; 7 long lateral hairs present on joint just proximal to base of g-bristle.

Second Antenna: Protopodite bare except for minute, distal, medial bristle. Endopodite 3 jointed (Figure 45*f*): 1st joint elongate, bare; 2nd joint elongate, with 3 ventral bristles (distal of these ½ length of others); 3rd joint elongate, reflexed on 2nd, with long proximal bristle with blunt tip; tip of joint pointed and bearing ridges. Exopodite: 1st joint elongate, with long hairs forming few distal rows; 2nd joint about three times length of 3rd joint; joints 3–9 gradually decreasing in size; bristles of joints 2–8 with natatory hairs; 9th joint with 4 bristles (3 long, 1 short, all with natatory hairs); joints 2 or 3 to 8 each with minute basal spine (some spines with blunt tips); joints 2–8 with faint short spines and long hairs along distal margins; 9th joint with minute, blunt lateral spine; medial distal bristle not observed on 1st joint but could be present.

Mandible (Figure 46*a*): Coxale endite: slender medial bristle present near base of ventral branch; ventral branch with spines forming 4 oblique groups, and pointed tip with several minute spines; ventral margin of dorsal branch with 4 small processes and short main spine; tip of dorsal branch with slender terminal spine (broken off on illustrated limb but present on opposite limb of same specimen); dorsal margin of branch with distal bristle set back from tip of branch (broken off on both limbs of USNM 158387). Basale endite with 4 end-type bristles, 3 triaenid bristles with 2–4 sets of paired marginal teeth excluding terminal pair, 1 dwarf bristle, and glandular peg. Basale: dorsal margin with 2 long subterminal bristles; medial surface with 1 short triaenid bristle with 3 pairs of marginal spines excluding terminal pair and 1 minute spine-like bristle, both near ventral margin. Exopodite reaching past middle of dorsal margin of 1st endopodial joint, hirsute, with 2 short subterminal bristles. 1st endopodial joint with 3 long, spinous, ventral bristles. 2nd endopodial joint: dorsal margin with 2 proximal bristles, and stout a-, b-, c-, and d-bristles; ventral margin with 3 long, spinous, terminal bristles; medial side with spines forming rows, 1 cleaning bristle between b- and c-bristles, 4 cleaning bristles forming oblique row near base of c-bristle, and 1 short

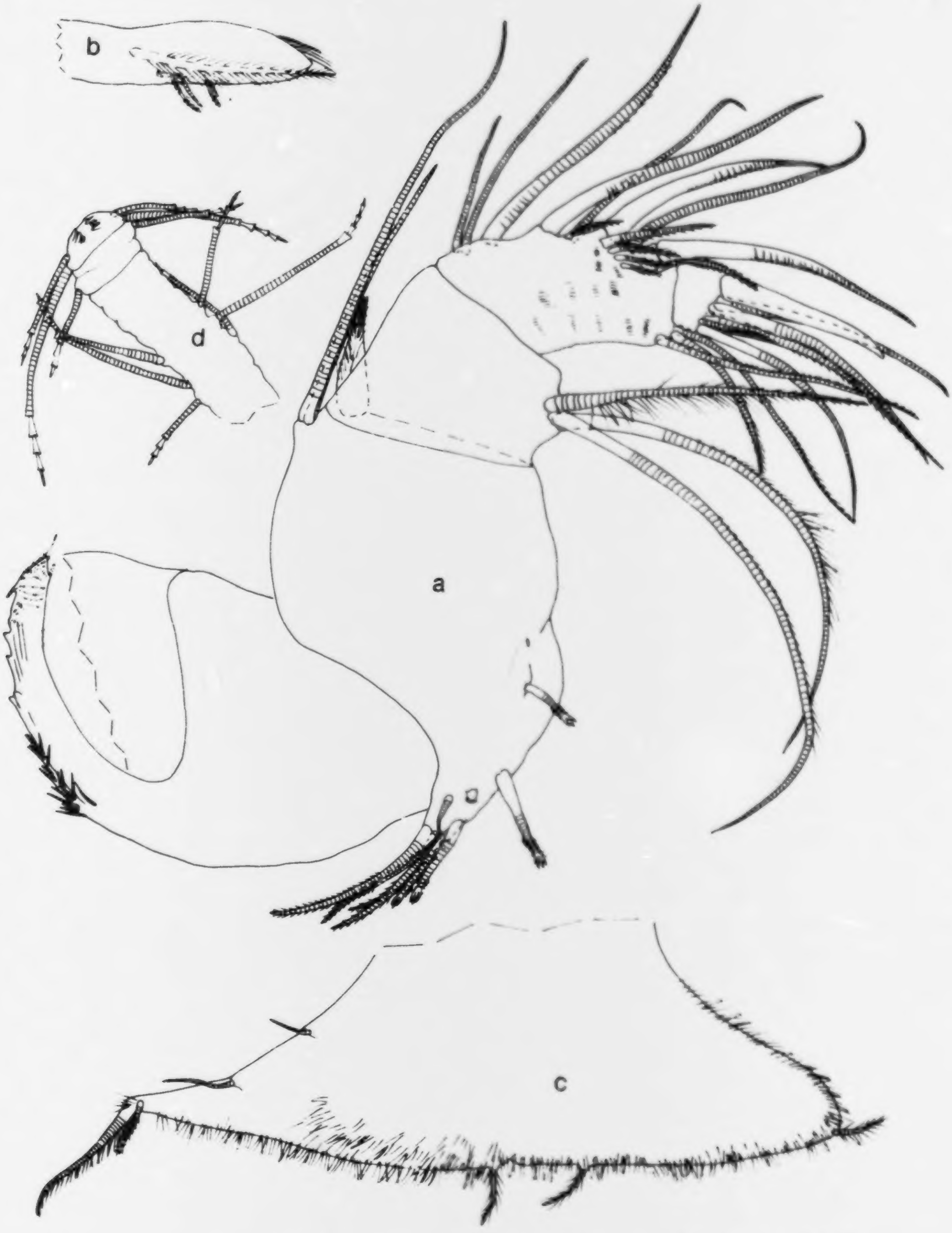

FIGURE 46.—*Postasterope abaco*, new species, USNM 158387, paratype, adult male, length 1.48 mm: *a*, left mandible, medial view; *b*, comb of left 5th limb, lateral view; *c*, right 6th limb, medial view; *d*, 7th limb.

AVAILABLE

spinous bristle near base of d-bristle; lateral side with 1 long spinous bristle between b- and c-bristles and between c- and d-bristles (none between b- and c-bristles on right limb of USNM 158387). End joint with straight dorsal claw with few lateral teeth near ventral margin, and 5 bristles (medial of these short).

Maxilla (Figure 45*g*): Epipodial appendage with pointed hirsute tip. Endite I with 3 bristles (2 long, stout, 1 small, medial); endite II with 3 long stout bristles. Basale: medial side hirsute, with 2 short bristles near dorsal margin; lateral side with 1 small proximal bristle; ventral margin with 1 short proximal bristle, 1 small distal bristle, and 1 long, spinous, terminal bristle. Endopodite: 1st joint with small proximal protuberance and midbristle on anterior margin, and long beta-bristle; end joint with long terminal bristle (lengths of beta-bristle and terminal bristle on illustrated limb obtained from opposite limb of same specimen).

Fifth Limb (Figure 46*b*): Comb with long, stout, spinous, exopodial bristle reaching just past tip of comb; 2 slender bristles present ventral and distal to base of stout exopodial bristle, and 2 pairs of bristles closer to ventral margin; hairs present along terminal margin of comb, and row of short and long bristles present along ventral margin.

Sixth Limb (Figure 46*c*): Anterior margin with 1 upper and 1 lower endite bristle; anterior corner of skirt with 2 bristles (longer of these two to two and one-half times length of other); ventral margin of skirt with 2 small bristles near middle and 1 or 2 short bristles on posterior corner; lateral flap hirsute but without bristles.

Seventh Limb (Figure 46*d*): Proximal group with 6 bristles (3 on each side); distal group with 6 bristles (3 on each side); bristles with 2–4 bells. Terminus consisting of opposing combs, each with about 9 spinous teeth (spines not shown on illustrated limb).

Furca (Figure 45*i*): Each lamella with 8 bristles, (posterior 2 of these bristle-like but not oriented backwards); main claws with short and long teeth forming row along posterior edge; claw 1 of right lamella located anterior to claw 1 of left lamella.

Bellonci Organ (Figure 45*h*): Elongate, broadening in middle, with rounded tip.

Eyes (Figure 45*h*): Medial eye unpigmented, with dorsal hairs. Lateral eye larger than medial eye, with amber pigment and 18–20 ommatidia. (Lateral eye was probably black prior to preservation.)

Upper Lip (Figure 45*h*): Paired lobes and lateral flaps hirsute; no spines observed.

Copulatory Organs: Each organ with 3 small terminal lobes.

Posterior of Body (Figure 45*i*): With elongate, hirsute, finger-like dorsal process.

Y-Sclerite: Typical for subfamily.

COMPARISONS.—The new species ***P. abaco*** differs from *P. corrugata* and ***P. messingi*** in having 3 instead of 4 bristles on endite I of the maxilla. ***Postasterope abaco*** also differs from ***P. corrugata*** in having a triaenid bristle rather than a simple bristle on the ventral margin of the mandibular basale. ***Postasterope abaco*** is considerably larger than *P. messingi*.

Genus and Species Inquirenda

Asterope mariae sensu Tressler, 1949

Asterope mariae (Baird).—Tressler, 1949:338, fig. 22. [Not *Cypridina mariae* Baird, 1850:257.]

DISCUSSION.—Tressler (1949:338) referred 2 immature females from the west side of Loggerhead Key, Tortugas, Florida, collected on 26 June 1931 to *Asterope mariae* (Baird). Dimensions of one of the specimens were given as length 1.43 mm, height 0.67 mm. A lateral view of the carapace showing the lateral eye was illustrated (Tressler, 1949, fig. 22). It is not clear whether Tressler's description of the 7th limb and furca are from the Tortugas specimens or from adult females of *Cylindroleberis mariae* described by others and collected elsewhere. The 2 specimens are not in the collection of the National Museum of Natural History, and probably are not extant. *Asterope* preoccupied; objective synonym of *Cylindroleberis*.

Asterope oculata Brady, 1902 [part]

Asterope oculata Brady, 1902:179, pl. XXI: figs 6–13 [part, only those specimens from Cruz Bay].

DISCUSSION.—Brady (1902:179) described the new species *Asterope oculata* from males collected at Trincomalee, Sri Lanka, and 1 female and 1 or 2 males from Cruz Bay. Brady stated (1902:180): "I figure here in outline an example of both sexes from this locality [Cruz Bay]." His illustrations of the species consist of a lateral outline of a female showing lateral eye (pl. XXI: fig. 8), a female 1st antenna (pl. XXI: fig. 9), a female furcal claw (pl. XXI: fig. 13), lateral and dorsal views of a male showing lateral eyes (pl. XXI: figs. 6, 7), a male mandible (pl. XXI: fig. 11), and a male furcal lamella (pl. XXI: fig. 12). The female illustrations and the male carapace may be assumed to be from Cruz Bay. The male mandible and furcal lamella could be from either Cruz Bay or Trincomalee. Brady did not select a holotype.

Müller (1912:46) referred (with a question) *A. oculata* to *A. teres* (Norman, 1861).

Skogsberg (1920:523, fig. CII) described the male *A. oculata* from 2 syntypes from Sri Lanka and stated concerning species distribution (p. 527): "Whether it also occurs at St. Johns (Cruz Bay), Lesser Antilles, I cannot say; it seems rather probably, however, that this identification of G.S. Brady's is due to a mistake." In the synonomy of the species Skogsberg (p. 523) listed Brady's specimens as "*Asterope oculata* (part.)".

Poulsen (1965:413, fig. 137) referred 5 males from the Red Sea to *Synasterope oculata* (Brady, 1902) and included in his concept of the species Brady's specimens from Cruz Bay as well as the Sri Lanka specimens. However, on a map showing the distribution of species of *Synasterope*, Poulsen (1965, fig. 155) did not plot a West Indian locality for *S. oculata*, but did plot a locality in the South Atlantic at about 42°S, 55°W. Because Poulsen did not mention a disagreement with Skogsberg's locating Cruz Bay in the West Indies, I think the South Atlantic locality is a mistake.

Poulsen (1965:417) concluded that the small size of the specimen identified as a female by Brady (1902:180) shows that it is a juvenile, and that it is not possible to determine its sex on the basis of Brady's description. However, the small size of the lateral eye of the specimen suggests to me that it is a female. Its age cannot be determined with the data on hand, but its small size (length 1 mm) does not necessarily eliminate the possibility of it being adult. An adult female *Parasterope muelleri* from the West Indies has a length of 1.11 mm (Poulsen, 1965:376). It may be possible to resolve the age and sex of the specimen; according to notes I made in 1966 while examining the Brady collection at the Hancock Museum, Newcastle-on-Tyne, that museum has a male and female *A. oculata* (in drawer 6 of large cabinet), but I do not know whether they are types. The museum also has in the spirit collection specimens of *A. oculata* labeled types from Trincomalee (in Box 2, Section 2) (according to Brady (1902:180) the specimens are all males, but they warrant reexamination).

Without reexamination of type specimens from Cruz Bay it is not possible to conclude with certainty whether or not they are conspecific with those from Sri Lanka. The widely separated localities of the collections make it improbable that they are conspecific. The absence of a mid-bristle on the dorsal margin of the mandibular basale illustrated by Brady (1902, pl. XXI: fig. 11) suggests that the mandible is not that of a male from Sri Lanka, but, unfortunately, Brady's illustrations of the appendages of the species are not accurate.

In order to stabilize the concept of this species, a lectotype from either Cruz Bay or Sri Lanka should be selected. Because the specimens from Sri Lanka are better known that those from Cruz Bay as a result of Skogsberg's description, I believe that selection of a lectotype from Sri Lanka would be preferable. I herewith refer the specimens from Cruz Bay to "Genus and Species Inquirenda."

CYCLASTEROPINAE Poulsen, 1965

The Cyclasteropinae comprises 3 tribes: Cyclasteropini Poulsen, 1965, Cycloleberidini Hartmann, 1974, and Tetraleberidini Kornicker, 1981. Only last tribe is represented in the study area.

TETRALEBERIDINI Kornicker, 1981

This tribe comprises 2 genera: *Amboleberis* Kornicker, 1981, and *Tetraleberis*, Kornicker, 1981. Only the former genus is represented in the study area.

Amboleberis Kornicker, 1981

TYPE-SPECIES.—*Asterope americana* Müller, 1890:240.

DISTRIBUTION.—Madagascar, Gulf of Mexico, and Atlantic and Pacific Oceans in the vicinity of North, Central, and South America. Known depth range surface to 97.5 m.

COMPOSITION.—This genus is represented in the study area by 1 species, *A. americana* (Müller, 1890).

Amboleberis americana (Müller, 1890)

FIGURE 47

Amboleberis americana.—Kornicker, 1981a:168, figs. 62–66; pls. 42–46 [see for complete synonomy].

HOLOTYPE.—Unique specimen, present locality, if extant, unknown.

TYPE-LOCALITY.—Coast of South America (Pernambuco), pelagic.

MATERIAL.—See "Station Data with Specimens Examined."

DISTRIBUTION.—Atlantic Ocean: North Caroline to Florida, Dry Tortugas, Bahamas, Virgin Islands, Belize, Brazil. Gulf of Mexico: Florida, Texas. Pacific Ocean: Costa Rica, Gulf of Panama. Collected in surface plankton and on the bottom at intertidal depths and as deep as 97.5 m.

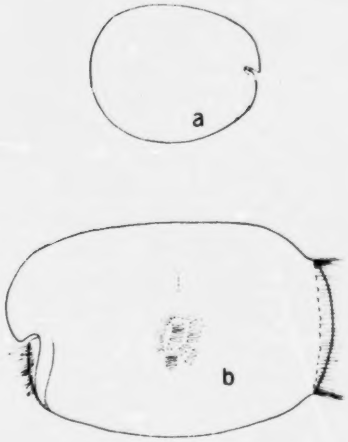

FIGURE 47.—*Amboleberis americana* (Müller): *a*, lateral view of ovigerous female showing position of central abductor muscle attachments (larger of 2 anterior dashed ovals), lateral eye (smaller of 2 anterior dashed ovals, and eggs), USNM 150290A, length 2.99 mm. (Figure from Kornicker, 1981a: fig. 63*a*); *b*, lateral view of adult male showing position of central abductor muscle attachments and left lateral eye (dashed), USNM 150296, length 3.49 mm (Figure from Kornicker, 1981a, fig. 65*a*).

ASTEROPTERONINAE Kornicker, 1981

This subfamily comprises 7 genera of which 3 have representatives in the study area: *Actinoseta* Kornicker, 1958, *Asteropella* Poulsen, 1965, and *Asteropterygion* Kornicker, 1981. Only these 3 genera are included in the Key, which is for species in the study area.

Key to Selected Genera of Asteropteroninae

1. Dorsal margin of each valve with continuous row of well-developed teeth; 2nd joint of endopodite of female 2nd antenna with marginal bristles; wide space on furcal lamellae between primary and secondary claws . . . . ***Actinoseta***

   Dorsal margin of each valve without teeth forming row; endopodite of female 2nd antenna without marginal bristles; without wide space on furcal lamellae between primary and secondary claws 2

2. Each valve with horizontal rib passing through or near central adductor muscle attachments; 2nd joint of endopodite of female 2nd antenna hirsute; furca with a proximal bristle placed laterally on lamella .... ***Asteropella***
   Each valve with rugose ornamentation; 2nd joint of endopodite of 2nd antenna bare; furca without proximal bristle placed laterally on lamella .... ***Asteropterygion***

Actinoseta Kornicker, 1958

TYPE-SPECIES.—*Actinoseta chelisparsa* Kornicker, 1958.

DISTRIBUTION.—Indian Ocean, Gulf of Mexico, Atlantic Ocean in vicinity of North, Central, and South America. Known depth range intertidal to 53.9 m.

COMPOSITION.—This genus is represented in the study area by 3 species, *A. chelisparsa* Kornicker, 1958, *A. hummelincki* Kornicker, 1981, and *A. jonesi* Kornicker, 1981.

Key to Selected Species of *Actinoseta*

1. Carapace with 2 posterodorsal ridges .... ***A. hummelincki***
   Carapace without 2 posterodorsal ridges 2
2. d-bristle of 1st antenna at least ½ length of e-bristle .... ***A. chelisparsa***
   d-bristle of 1st antenna about ⅒ length of e-bristle .... ***A. jonesi***

Actinoseta chelisparsa Kornicker, 1958

FIGURE 48

Actinoseta chelisparsa Kornicker, 1958:244, figs. 43A–L, 46:10A,B, 69A–F, 70A–I; 89H,J,P,Q; 1981a:192, figs. 9*o*, 11*e*, 16*d*, 17*e*, 72–77, pls. 52–58.

HOLOTYPE.—Ovigerous female, length 2.42 mm, height 1.92 mm (lost).

TYPE-LOCALITY.—Bimini, Bahamas.

MATERIAL.—See "Station Data with Specimens Examined."

DISTRIBUTION.—Atlantic Ocean: Florida, Bahamas, Virgin Islands, Bonaire, Curacao, Belize, Panama, Venezuela. Gulf of Mexico: Florida, Texas. Known depth range 1–34 m.

DIAGNOSIS.—Carapace oval in lateral view with small rostrum; left valve overlapping right along posterior and dorsal margins; posterior margin forming angle near midpoint; 3 or 4 low nodes in posterodorsal part of valve (Figure 48).

First Antenna: 8th joint with d-bristle at least ½ length of e-bristle.

Furca: Each lamella with 3 stout claws followed by space and then 2 or 3 short spinous bristles without annulae.

Actinoseta hummelincki Kornicker, 1981

FIGURE 49

Actinoseta hummelincki Kornicker, 1981a:201, figs. 9*q*, 10*c*, 13*c*, 14*f*, 15*e*, 78–84, pls. 59–61.

HOLOTYPE.—USNM 150292, adult female, length 2.39 mm, complete specimen in alcohol.

TYPE-LOCALITY.—Sta. 1408A, Virginia Key, Florida.

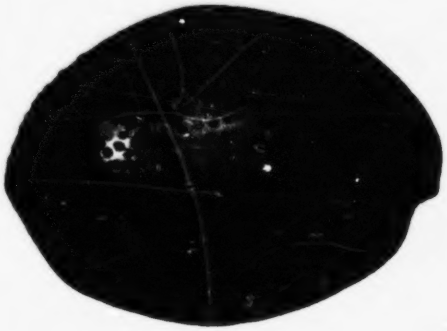

FIGURE 48.—*Actinoseta chelisparsa* Kornicker, lateral view of ovigerous female, USNM 15029, length 2.29 mm. (Figure from Kornicker, 1981a, fig. 72.)

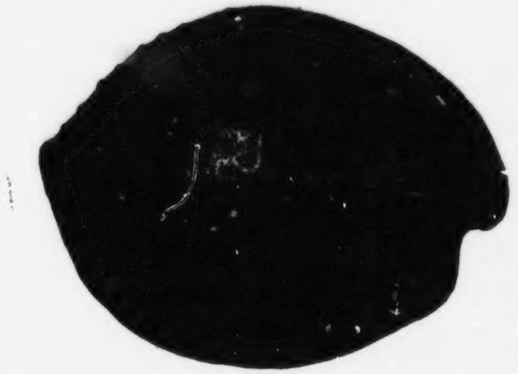

FIGURE 49.—*Actinoseta hummelincki* Kornicker, holotype, lateral view of adult female, USNM 150292, length 2.39 mm. (Figure from Kornicker, 1981a, fig. 78.)

MATERIAL.—No new material.

DISTRIBUTION.—Virginia Key, Florida; Carrie Bow Cay, Belize; Venezuela; Panama, Pacific Ocean. Known depth range 1–6 m.

DIAGNOSIS.—Carapace oval in lateral view with small rostrum; left valve overlapping right along posterior and dorsal margins; posterior margin forming angle near midpoint; 3 short ridges in posterior part of valves (Figure 49).

Furca: Each lamella with 3 stout claws followed by space and then 2 or 3 short bristles.

Actinoseta jonesi Kornicker, 1981

FIGURE 50

Actinoseta jonesi Kornicker, 1981a, figs. 9*p*, 85–87, pls. 62–65.

HOLOTYPE.—USNM 157636, ovigerous female.

TYPE-LOCALITY.—West of Punta Charagata, Isla Cubaque (S. of Isla de Margarita), Venezuela, depth less than 1.5 m.

MATERIAL.—No new material.

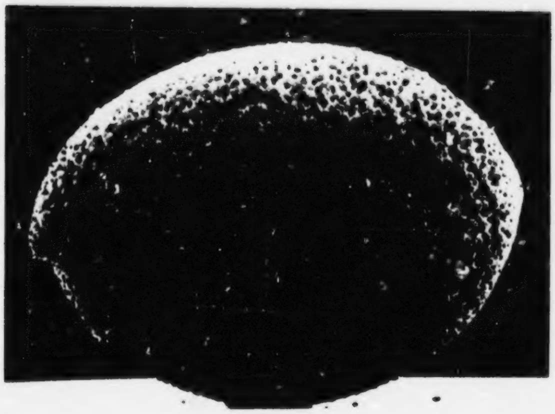

FIGURE 50.—*Actinoseta jonesi* Kornicker, holotype, lateral view of left valve of ovigerous female. USNM 157636, length 2.16 mm. (SEM micrograph from Kornicker, 1981a, pl. 62*a*.)

DISTRIBUTION.—Collected only at type-locality.

DIAGNOSIS.—Carapace similar to that of *A. monambon* except without the 3 minute processes in the posterdorsal part of the valve present in many specimens of that species (Figure 50).

First Antenna: d-bristle of 8th joint only about 1/10 length of e-bristle.

Asteropella Kornicker, 1975

TYPE-SPECIES.—*Asteropella mortenseni* Poulsen, 1965, by subsequent designation, Kornicker, 1975.

DISTRIBUTION.—Gulf of Mexico, Atlantic and Pacific Oceans in vicinity of North, Central, and South America between latitudes of about 37°30′N and 41°48′S. Known depth range intertidal to 57 m.

COMPOSITION.—This genus contains the following species in the study area: *A. agassizii* (Fritz Müller, 1870), *A. monambon* (Kornicker, 1958), *A. punctata* Poulsen, 1965, *A. mortenseni* Poulsen, 1965, *A. maclaughlinae* Kornicker, 1981, *A. kalkei*, new species, and *A. pax*, new species.

Key to Selected Species of *Asteropella*

1. Inner concentric ridge forming spiral . . . . ***A. agassizii***
   Inner concentric ridge without spiral 2

2. Carapace with abundant narrow ribs in addition to midrib . . . ***A. kalkei***
Carapace with 1 or 2 narrow ribs on each side of midrib . . . . ***A. mortenseni***
Carapace with only midrib 3
3. Posterodorsal corner of inner concentric ridge evenly rounded . . ***A. pax***
Posterodorsal corner with indentation or processes 4
4. Posterior end of inner concentric ridge with 3 or more small processes; d-bristle of 1st antenna about ¼ length of e-bristle . . . . . ***A. punctata***
Inner concentric ridge with process at each end of posterodorsal indentation, d-bristle of 1st antenna represented by minute spine or peg . 5
5. Midrib intersecting inner concentric ridge in vicinity of incisur . . . . ***A. monambon***
Midrib not intersecting inner concentric ridge . . . . . . ***A. maclaughlinae***

***Asteropella agassizii* (Fritz Müller, 1870)**

FIGURE 51

Asteropella agassizii.—Kornicker, 1981a:231, figs. 9*bb*, 97–99, pls. 85–88 [complete synonomy].

HOLOTYPE.—None selected

SYNTYPE LOCALITY.—Desterro [= Florianopolis], Santa Catarina Island, southern coast of Brazil.

MATERIAL.—No new material

DISTRIBUTION.—Panama at less than 1 m; Brazil, depth unknown.

DIAGNOSIS.—Inner concentric ridge not meeting in posterodorsal corner forming spiral in lateral view (Figure 51).

***Asteropella monambon* (Kornicker, 1958)**

FIGURE 52

Asteropteron monambon Kornicker, 1958:246, figs. 46: 11; 71A–G; 72A–D; 86D,H,K.—Poulsen, 1965:224.
Asteropella monamba.—Poulsen, 1965:217, 225.
Asteropella monambon.—Kornicker, 1975:561.—1981a:221, 222, figs. 9*aa*, 91–96, pls. 74–84.

HOLOTYPE.—USNM 122899, adult male, attached valves, upper lip and furca in alcohol, remaining appendages on 2 slides.

TYPE-LOCALITY.—Bimini, Bahamas

MATERIALS.—See "Station Data with Specimens Examined."

DISTRIBUTION.—Bahamas, Belize, Cuba,

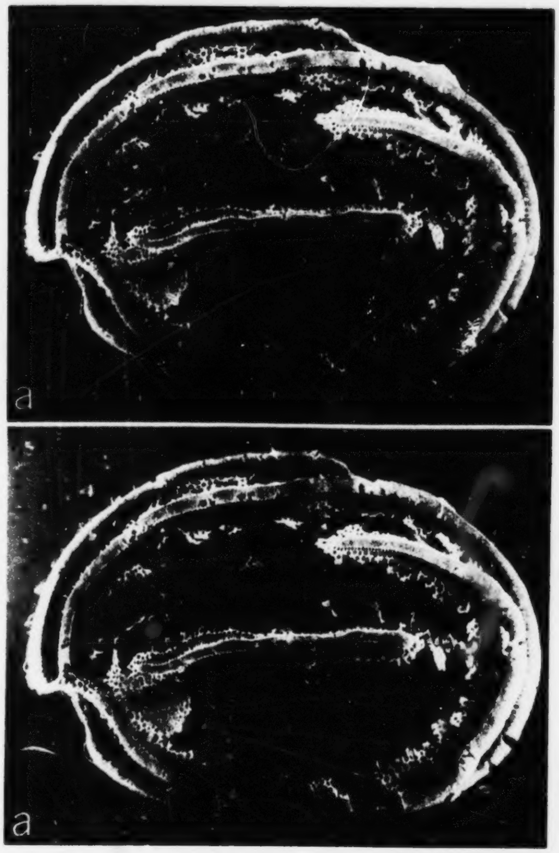

FIGURE 51.—*Asteropella agassizii* (Müller), stereoscopic pair of left valve of adult female, USNM 150288*b*, length 1.95 mm. (SEM micrograph from Kornicker, 1981a, pl. 85*a*.)

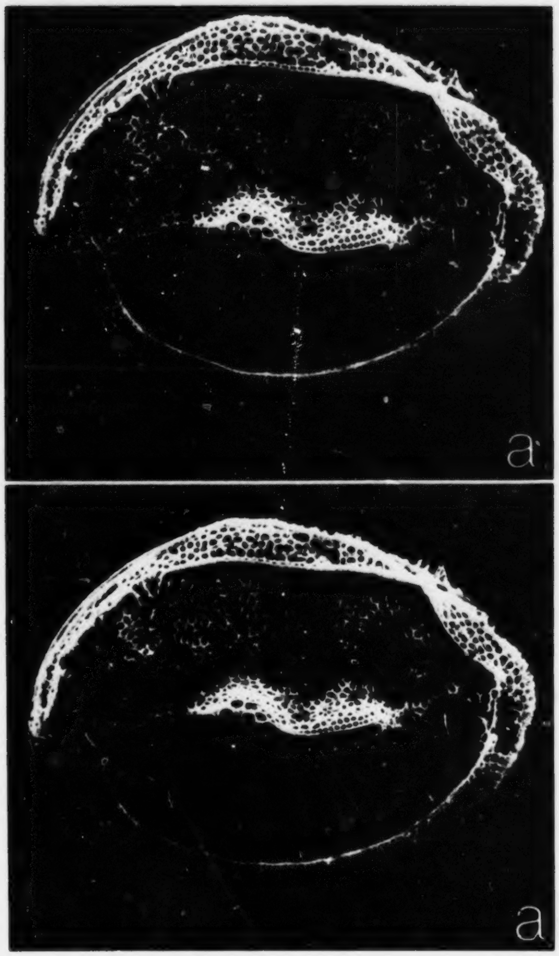

FIGURE 52.—*Asteropella monambon* (Kornicker), stereoscopic pair of left valve of adult male. USNM 157366A, length 1.25 mm. (SEM micrograph from Kornicker, 1981a, pl. 76*a*.)

Puerto Rico; depth range 1–24 m.

DIAGNOSIS.—Concentric ridge lying just within and parallel to valve edge except in posterodorsal corner where shallow indentation forms angle; narrow horizontal midrib intersecting concentric ridge in vicinity of incisur (Figure 52).

First Antenna: 8th joint: d-bristle represented by minute peg; e-bristle about ½ to ¾ length of a-claw.

Asteropella mortenseni Poulsen, 1965

FIGURE 53

Asteropella mortenseni Poulsen, 1965:169, 222, 225, 236–238, 241, 473, 474, 476, 478–480, figs.73, 76–79, 81, 150f.h".—Kornicker, 1981a:244, figs. 9*u*, 10*a*, 11*j*, 12*a*, 13*a*, 14*a*, 15*c*, 16*a*.

HOLOTYPE.—Female, length 1.7 mm, Zoological Museum, Copenhagen.

TYPE-LOCALITY.—Virgin Islands, West Indies

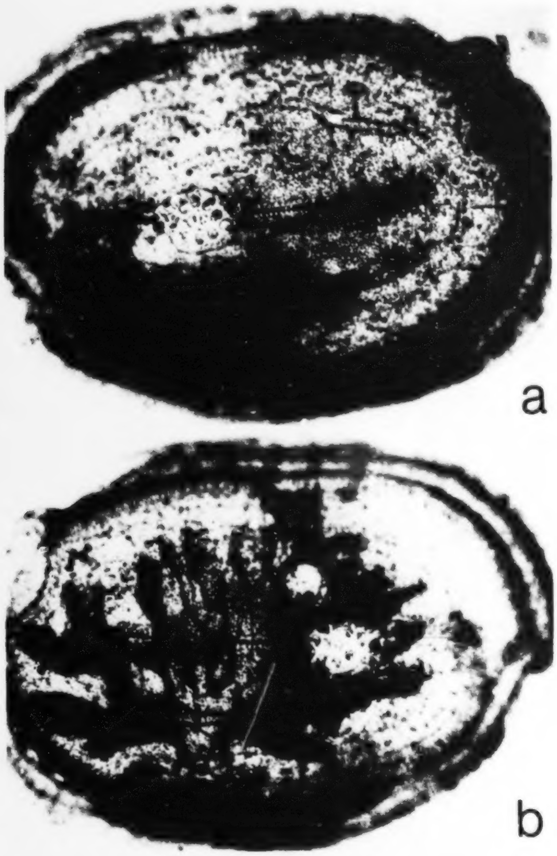

FIGURE 53.—*Asteropella mortenseni* Poulsen, adult female, USNM 192153, length 1.61 mm: *a*, lateral view of left valve; *b*, lateral view of right valve showing tree-like calcareous concretion probably formed after death of animal. (Photographs with transmitted light taken by Dr. Robert P. Higgins.)

MATERIAL.—See "Station Data with Specimens Examined."

DISTRIBUTION.—Virgin Islands. Known depth range 9–40 m.

DIAGNOSIS.—Concentric ridge of carapace with deep indentation in posterodorsal corner; generally 1 narrow horizontal rib present dorsal to midrib and 2 ventral to midrib; these ribs generally intersect anterior end of midrib; midrib intersects concentric ridge in vicinity of incisur (Figure 53).

REMARKS.—Considerable variability was observed in the rib that is ventral and dorsal to the midrib on the shells of this species. On some valves the ribs are slightly curved and continuous, similar to those on the specimen illustrated by Poulsen (1965, fig. 76a) but on others the ribs divide into 2 or more segments and have an undulating and varied configuration (Figure 53).

Asteropella punctata Poulsen, 1965

FIGURE 54

Asteropella punctata Poulsen, 1965:169, 172, 222, 225, 234, 241, figs. 73, 80, 81.—Kornicker, 1981a:235, figs. 9*x*, 10*b*, 100–102, pls. 89–91.
Asteropella punctatum.—Poulsen, 1965:478.

HOLOTYPE.—Female, length 1.5 mm, unique specimen.

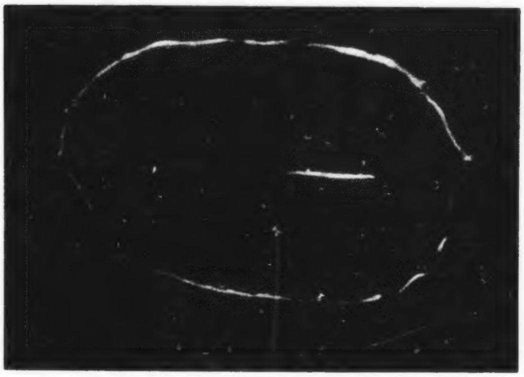

FIGURE 54.—*Asteropella punctata* Poulsen, lateral view of adult female, USNM 157365, length 1.53 mm. (Figure from Kornicker, 1981a, fig. 101.)

TYPE-LOCALITY.—East coast of Thatch Island, West Indies, 25–30 m.

MATERIAL.—See "Station Data with Specimens Examined."

DISTRIBUTION.—Thatch Cay, Virgin Islands; Cuba, continental shelf west of Florida. Known depth range 6–30 m.

DIAGNOSIS.—Concentric ridge lying just within and parallel to valve edge except in posterior part where ridge forms several small processes: narrow horizontal midrib generally not intersecting concentric ridge (Figure 54).

First Antenna: 8th joint: d-bristle about ¼ length of a-claw; e-bristle about same length as a-claw.

REMARKS.—Unlike previously described specimens, the midrib of some specimens collected on the continental shelf west of Florida weakly intersects the concentric ridge in the vicinity of the incisur.

Asteropella maclaughlinae Kornicker, 1981

FIGURE 55

Asteropella maclaughlinae Kornicker, 1981a:244, figs. 9*y*, 104–107, pls. 92–96.

HOLOTYPE.—USNM 157608, adult female, length 1.72 mm.

TYPE-LOCALITY.—Anclote Anchorage, west coast of Florida off Tarpon Springs, north of Tampa, 1.0 m.

MATERIAL.—See "Station Data with Specimens Examined."

DISTRIBUTION.—St. Lucie Inlet, east coast of Florida; Belize; Gulf of Mexico: Florida, Texas. Known depth range 1–22.5 m.

DIAGNOSIS.—Thin flange on valve outer surface just within and parallel to valve edge; concentric ridge lying just within flange and parallel to valve edge except in posterodorsal part where indentation forms angle, and in vicinity of incisur where ridge is broadly rounded; prominent midrib not intersecting concentric ridge (Figure 55).

First Antenna: 8th joint: d-bristle represented by minute peg; e-bristle about same length as a-claw.

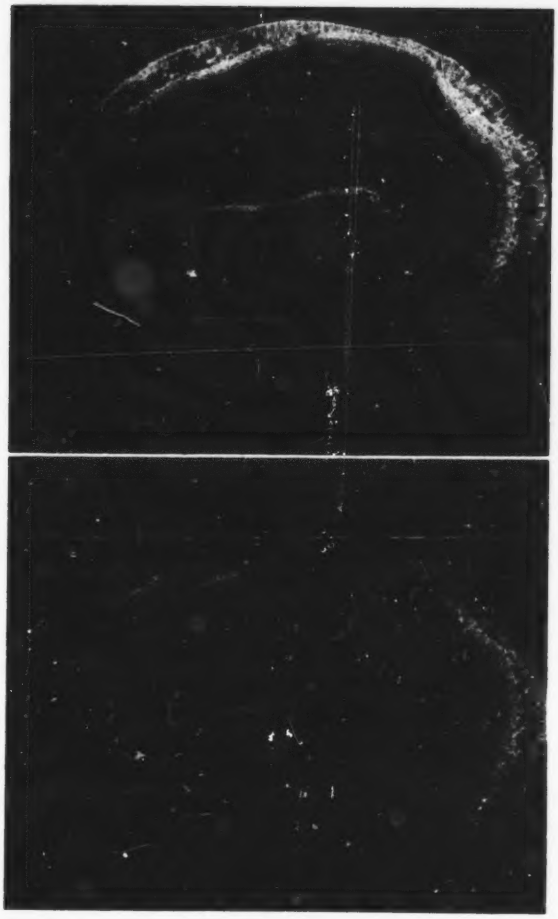

FIGURE 55.—*Asteropella maclaughlinae* Kornicker, holotype, stereoscopic pair of left valve of adult female, USNM 157608, length 1.72 mm. (SEM micrograph from Kornicker, 1981a, pl. 92*a*.)

Asteropella kalkei, new species

FIGURES 56–60

ETYMOLOGY.—The species is named for Richard D. Kalke, The University of Texas Marine Science Institute, from whom I received the specimens.

HOLOTYPE.—USNM 159083, ovigerous female on slide and in alcohol.

TYPE-LOCALITY.—Off Weeks Island, Louisiana, sta W13, 29°04′22″N, 91°44′24″W, 6.4 m.

FIGURE 56.—*Asteropella kalkei*, new species, USNM 159083, holotype, lateral view of adult female, length 1.62 mm.

PARATYPES.—Off Weeks Islands, Louisiana: sta W2: USNM 193134, 1 specimen. Sta W5: USNM 193141, 2 specimens. Sta W6: USNM 193130, 10 specimens; USNM 193129, 2 specimens. Sta W7: USNM 193124, 4 specimens; USNM 193140, 4 specimens; USNM 193143, 9 specimens. Sta W8: USNM 193127, 1 specimen, USNM 193142; 4 specimens; USNM 193125, 1 specimen. Sta W11?: USNM 193128, 2 specimens. Sta W12 USNM 193137, 1 specimen. Sta W13 (type-locality): USNM 193138, 2 specimens; USNM 193131, 1 specimen; USNM 197139,3 specimens; USNM 159086, 1 ovigerous female; USNM 193119, 1 specimen. Sta 14: USNM 193136, 2 specimens. Sta 15A: USNM 193133, 5 specimens; USNM 193121, 1 adult male; USNM 193122, 1 adult male; USNM 193123, 13 specimens; USNM 193132, 8 specimens; USNM 193120, 10 specimens. Sta WR4: USNM 193135, 2 specimens. Off Port Aransas, Texas: USNM 193126, 50 specimens.

DISTRIBUTION.—Off Port Aransas, Texas, and Weeks Island, Louisiana, depth range 4–8 m.

DESCRIPTION OF ADULT FEMALE (Figures 56–60).—Carapace oval in lateral view with small rostrum and incisur (Figure 56). Surface of carapace with abundant narrow ridges: continuous oval ridge paralleling valve margin at about ¾ length of radius; narrow concentric ridges lying between the oval ridge and valve margin; both oval ridge and concentric ridges slightly indented in vicinity of incisur; a narrow midridge extending from point of indenture of oval ridge in vicinity of incisur, through area of central muscle attachments lying just anterior to valve middle, and terminating at valve midheight about halfway between valve middle and posterior end of oval ridge; abundant narrow ridges present between midrange and concentric oval ridge, some bifurcating.

Carapace Bristles (Figures 56, 59*a,b,e*, 60*d,f*): Long bristles present along anterior, ventral, and posterior margins (not all shown in Figure 56); bristles emerge from open pores (Figure 60*f*) and have minute marginal papillae (Figure 60*f*).

Infold: Infold just ventral to inner end of incisur with 2 bristles (1 near middle of infold, other shorter and near inner margin of infold); anterodorsal infold dorsal to incisur with 24 bristles forming single or double row; posteroventral list with about 20 long and 23 short bristles.

Selvage: Lamellar prolongation of selvage present along anterodorsal, anterior and ventral margins of value; edge of selvage with fringe along anterodorsal, ventral, and posterior margins of valve; edge of salvage serrate along anterior margin (Figure 60*e*).

Size: USNM 159086, length of right valve 1.51 mm, height 1.03 mm; USNM 159083, length 1.62 mm, height 1.10 mm.

First Antenna (Figure 57*a*): 1st joint with spines along ventral margin and on medial surface. 2nd joint ventral margin with long spines; dorsal margin with proximal spines and 5 spinous bristles. 3rd joint triangular, with long, spinous, ventral bristle and 5 dorsal bristles (1 proximal, 4 subterminal). 4th joint with 3 bristles (2 ventral, 1 dorsal). Sensory bristle of 5th joint terminating in 2 filaments having bifurcate tips. 6th joint with long, spinous, medial bristle. 7th joint: a-bristle claw-like reaching past middle of sensory bristle of 5th joint; b- and c-bristles similar in length, both without marginal filaments. 8th joint: d-bristle missing; e-bristle almost twice length of a-bristle, with bristle-like well-defined rings (not filament-like) and marginal spines; f- and g-bristles similar to b- and c-bristles, without filaments; a small lateral pore present on 8th joint near base of e-bristle and just ventral to it, b-, c-, f-, g-bristles with 3 or 4 fused rings on bristle at distance from base about equal to length of a-bristle. (As usual, when either the d- or e-bristle is not present, it is not possible to be certain which of them is missing.)

Second Antenna (Figure 57*b*): Protopodite with long, spinous, medial bristle. Endopodite with fused joints, all with hairs; boundary between 1st and 2nd joints probably where endopodite bends backward; boundary between 2nd and 3rd joint indicated by marginal indentation at about ⅓ length of endopodite; terminal joint with long filament. Exopodite: 1st joint with minute, terminal, medial bristle bent at right-angle and with blunt tip; terminal end of 1st joint with very faint medial hairs, especially near medial bristle; bristles of joints 2–8 with natatory hairs; bristles of joints 2–5 also with few slender ventral spines near middle; 9th joint with 1 long bristle with natatory hairs, 1 medium bristle (about ¾ length of long bristle) with natatory hairs, and 1 short bristle (tip of exopodite missing on 1 limb and obscure on other); no basal spines but few faint hair-like spines present along distal margins of some joints.

Mandible (Figure 57*c,d*): Coxale endite with small bristle at base of ventral branch; ventral branch with stout spines forming 4 oblique rows and hairs forming proximal row; tip of branch with 3 small teeth, dorsal of these with faint spines; ventral margin of dorsal branch with 2 small knobs followed by 2 larger knobs; main spine with small teeth along inner margin; margin between main spine and tip of branch serrate; small spine at tip of branch spinous; dorsal corner of tip of branch with hirsute bristle about 3 times length of terminal spine; dorsal margin of dorsal branch with few spines distal to middle. Basale: tip of endite with 2 end bristles (1 of these much longer than others) and 2 triaenid bristles; additional triaenid bristle and shorter spinous bristle

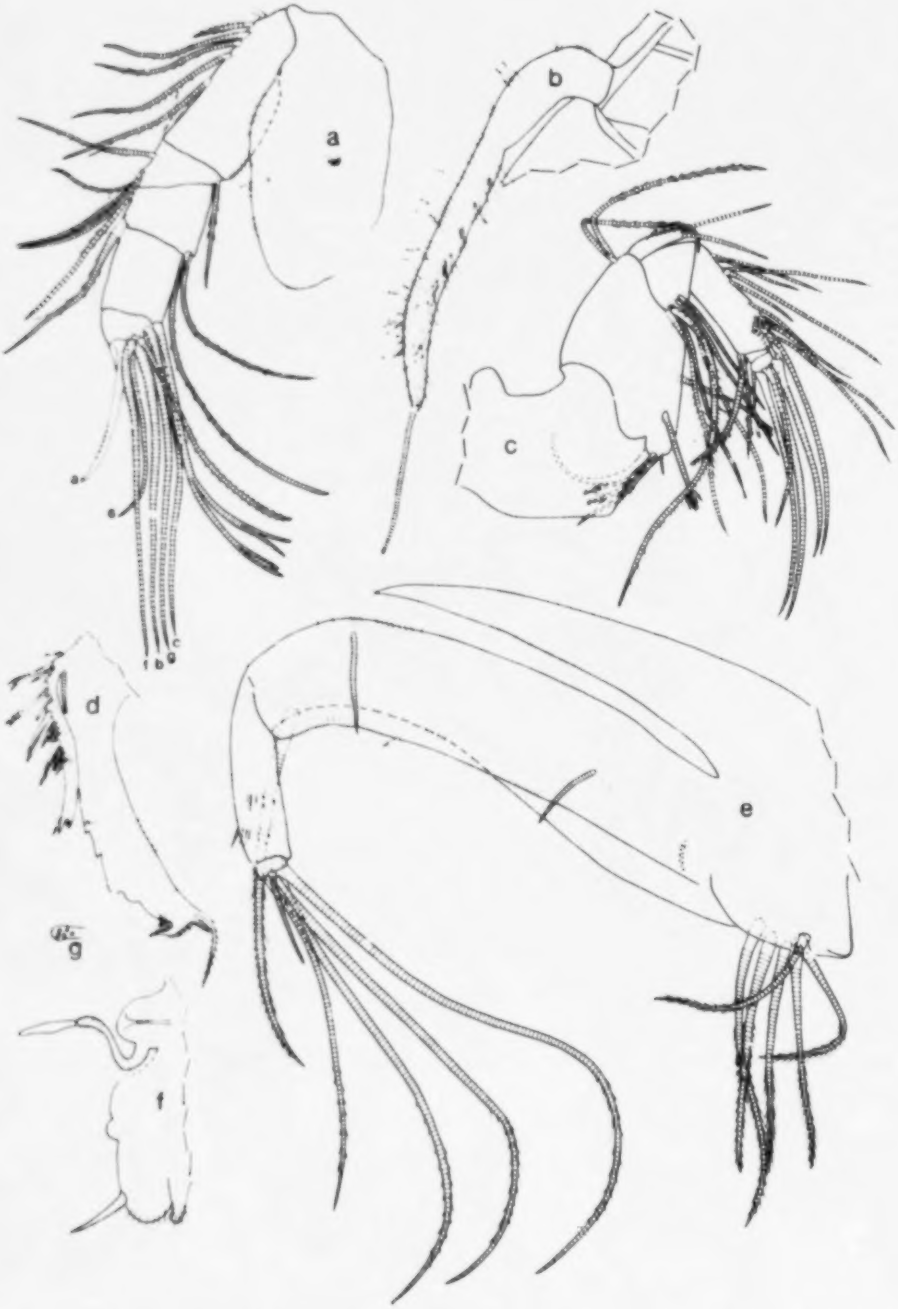

FIGURE 57.—*Asteropella kalkei*, new species, USNM 159083, holotype, adult female, length 1.62 mm: *a*, left 1st antenna, lateral view; *b*, endopodite of right 2nd antenna, medial view; *c*, right mandible, lateral view; *d*, coxale endite of left mandible, medial view; *e*, right maxilla, medial view; *f*, anterior of body showing medial eye and bellonci organ, and upper lip with lateral flap; *g*, left lateral eye.

on endite near its base; ventral margin of basale with 1 or 2 triaenid bristles (1 pair of marginal spines much longer than others); dorsal margin of basale with 2 long, spinous, terminal bristles. Exopodite spinous with 2 terminal bristles. Ventral margin of 1st endopodial joint with 1 long stout bristle with long marginal spines, 1 shorter bristle with long marginal hairs, and 4 short bristles with short marginal spines (the short marginal spines not shown on illustrated limb). 2nd endopodial joint: dorsal margin and lateral surface near dorsal margin with 11 bristles (not all shown in illustrated limb); medial surface near dorsal margin with 5 spinous cleaning bristles forming row (marginal spines not shown in illustrated limb); medial surface with spines forming rows; ventral margin with 2 spinous terminal bristles (medial of these stouter than other and with spines only along dorsal margin). End joint with 3 long claw-like bristles, 1 shorter, spinous, lateral bristle, and 1 small ventral bristle.

Maxilla (Figure 57*e*): Endites not well defined, consisting of 6 long spinous bristles. Epipodite long, reaching well past middle of dorsal margin of basale. Basale: both medial and lateral sides with 1 short proximal bristle; dorsal margin with 1 distal bristle; ventral margin with minute faint distal bristle and long spinous terminal bristle. Endopodite: 1st joint spinous, with long beta-bristle with marginal spines; end joint with 1 short bare bristle and 3 long spinous bristles. Exopodite absent.

Fifth Limb (Figure 58*a*): Lateral side of comb with 1 long, spinous, distal bristle near dorsal margin, 1 long, spinous, proximal bristle near ventral margin, 3 short bristles close to ventral margin, and 2 short slender bristles with bases just dorsal to long proximal bristle: dorsal margin with long hairs near tip (not shown on illustrated limb).

Sixth Limb (Figure 58*b*): Anterior margin of trunk with 15 short spinous bristles forming row; medial side of trunk close to ventral margin with 1 short spinous bristle in anterodorsal corner, 4 short spinous bristles forming row near middle, and 2 longer spinous bristles with bases just proximal to small but distinct indentation at boundary between trunk and skirt; anterior margin of lateral flap with about 15 spinous bristles; ventral margin of skirt with about 26 spinous bristles; posterior end of skirt with 1 hirsute bristle.

Seventh Limb (Figure 58*c*): Each limb with 17–20 bristles with up to 7 bells; terminus with 10 or 11 spinous teeth.

Furca (Figure 58*d*): Each lamella with 3 stout main claws followed by 4 short secondary claws and then, a more slender bristle-like claw placed slightly laterally on lamella; main claws with stout teeth forming row along posterior margin; some of the proximal teeth longer than others; teeth not present near tip of claws; 4 secondary claws with faint distal teeth along posterior margin; posterior bristle-like claw with few faint spines near tip; right lamella positioned farther forward than left lamella; right lamella with hairs present on anterior margin and proximal to claw 1.

Eyes: Lateral eyes unpigmented, small, with 5 minute cells (Figure 57*g*). Medial eye bare, unpigmented (Figure 57*f*).

Bellonci Organ (Figure 57*f*): Elongate, broader proximal and distal to constriction; hirsute proximal to constriction; tip rounded.

Upper Lip (Figure 57*f*): Consisting of 2 hirsute lobes, each with stout anterior process with broad proximal part and thin probe-like tip with open end; a hirsute lateral flap present on each side of mouth.

Posterior of Body (Figure 58*d*). Finger-like dorsum with terminal hairs, hairs present along posterior margin between furca and base of dorsum.

Gills (Figure 58*d*): Long, narrow.

Y-Sclerite (Figure 58*d*): Linear without ventral branch.

Eggs: USNM 159083 with 8 eggs in marsupium.

COMPARISONS.—The ridges on the carapace of *A. kalkei* are more numerous than on other species of the genus. *Asteropella kalkei* also differs from other species of the genus in having a bristle-like e-bristle with marginal spines. The spinous e-bristle is sufficiently different from the

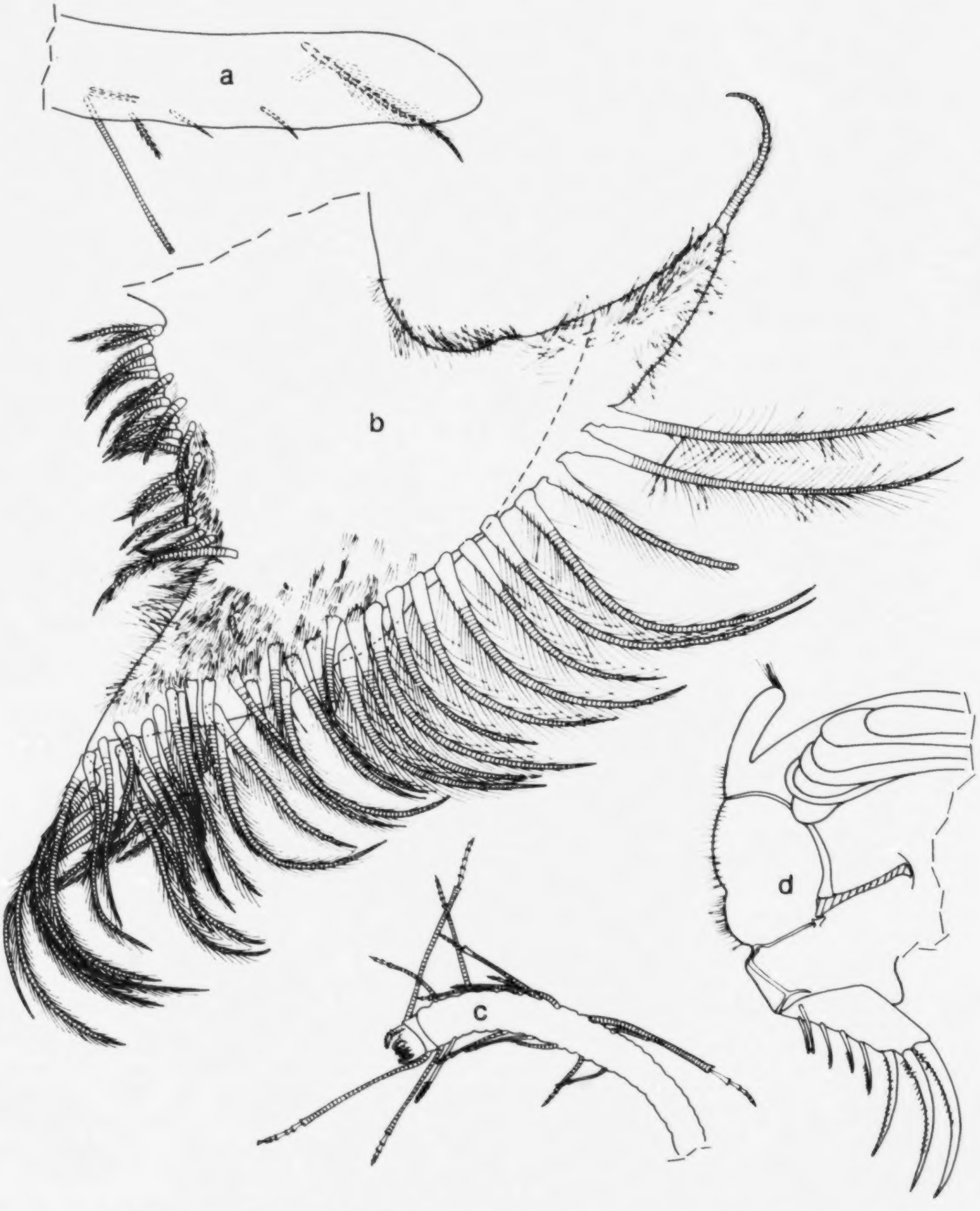

FIGURE 58.—*Asteropella kalkei*, new species, USNM 159083, holotype, adult female, length 1.62 mm: *a*, right 6th limb, medial view; *b*, comb of left 5th limb, medial view; *c*, 7th limb; *d*, posterior of body showing right lamella of furca, thumb-like dorsal process, right Y-sclerite and girdle, and 7 gill-like structure on right side of body.

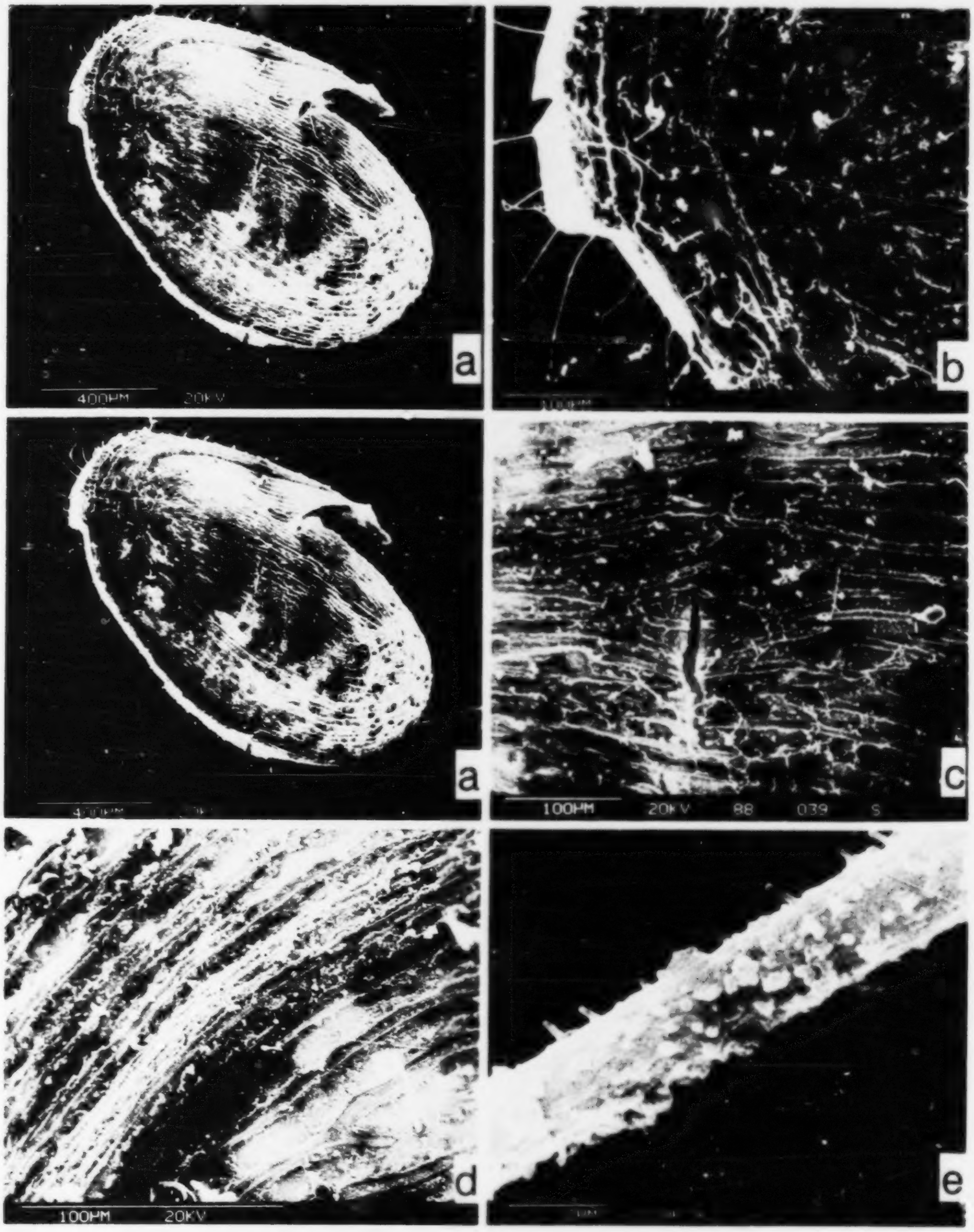
a
400µM 20KV
b
a
c
100µM 20KV 88 039 S
d
100µM 20KV
e

FIGURE 59.—*Asteropella kalkei,* new species, USNM 159086, paratype, adult female, left valve: *a,* lateral view of valve, anterior toward upper left, stereoscopic pair (tear in dorsal part of valve); *b,* anterior part of valve showing small incisur; *c,* ridges near center of valve; *d,* oval ridge and concentric ridges in anterodorsal corner of valve; *e,* detail of bristle shown in 60*d*.

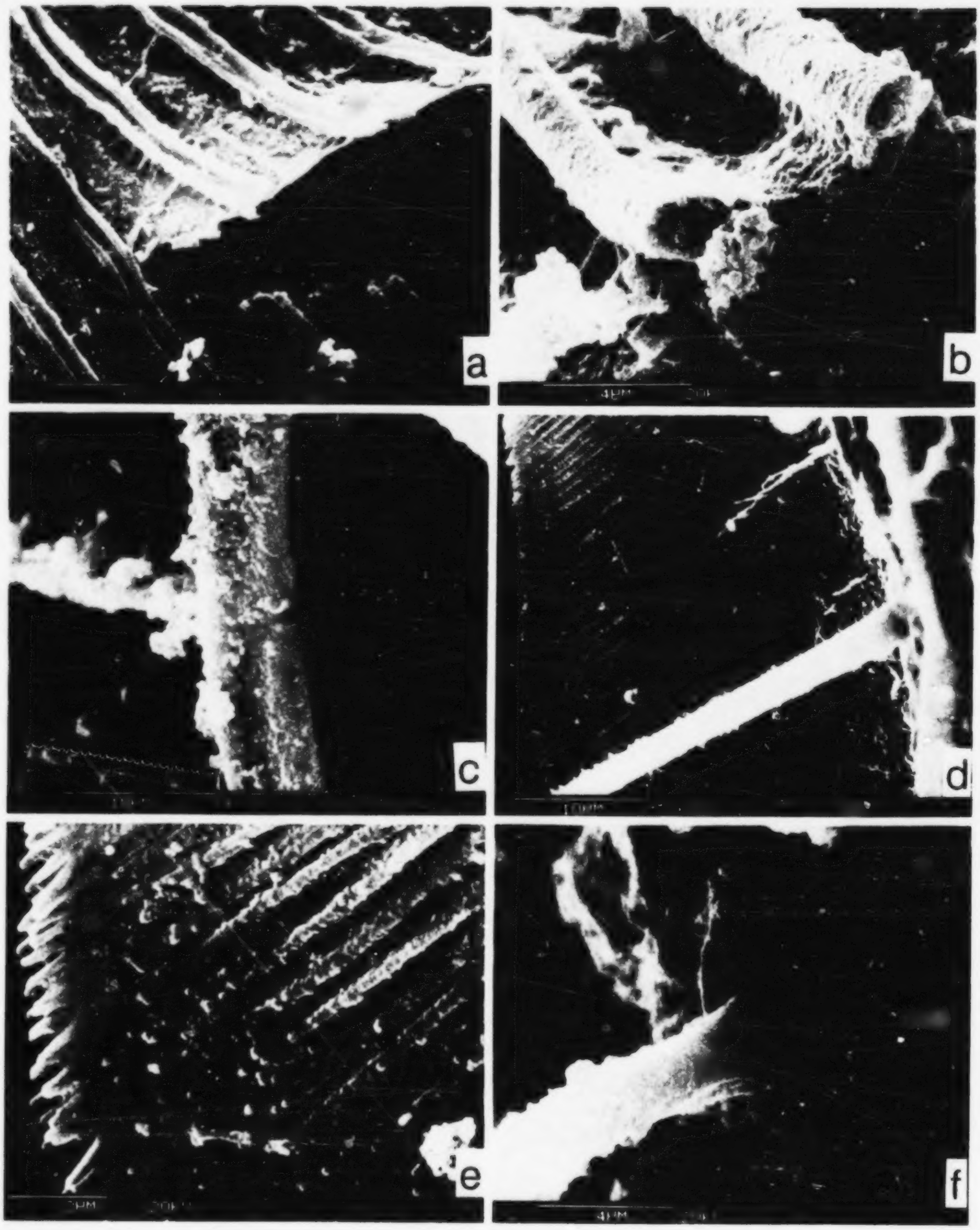

FIGURE 60.—*Asteropella kalkei*, new species, USNM 159086, paratype, adult female, left valve: *a*, detail showing concentric ridges, from Figure 59*a*; *b*, detail of ridges in *a*; *c*, detail of oval ridge showing vertical struts, from Figure 59*b*; *d*, detail showing anterior part of lamellar prolongation of selvage, from Figure 59*b*; *e*, detail from *d*; *f*, proximal part of bristle and bristle pore near anterior of valve.

bare filament-like bristle of other species that have been referred to *Asteropella* to form the basis for a new genus. I have not proposed a new genus because of the general similarity of the carapace of the new species with other species of *Asteropella*. A spinous bristle-like d-bristle is present on the monotypic genus *Omegasterope* Kornicker (1981a:343), which differs from *Asteropella kalkei* in shell ornamentation as well as in other characters.

REMARKS.—The new species was mentioned as having a fingerprint-like pattern on each valve in Kornicker (1981a:220).

Asteropella pax, new species

FIGURE 61

Asteropella species 1.—Kornicker, 1981a:275.

ETYMOLOGY.—From the Latin *pax*, ("peace"), used as a noun in apposition.

HOLOTYPE.—USNM 159087, adult male on slide and in alcohol.

TYPE-LOCALITY.—Gulf of Mexico, R/V *Longhorn*, transect IV, sta 4.

PARATYPES.—West Florida continental shelf, sta 14, USNM 193151, 193152, 2 specimens. Texas continental shelf: sta 4, transect III: USNM 193145, 1 specimen; USNM 159088, 1 A-1 male; USNM 193144, 1 specimen. Sta 4, transect IV: USNM 193146, 1 juvenile; USNM 193147, 1 specimen.

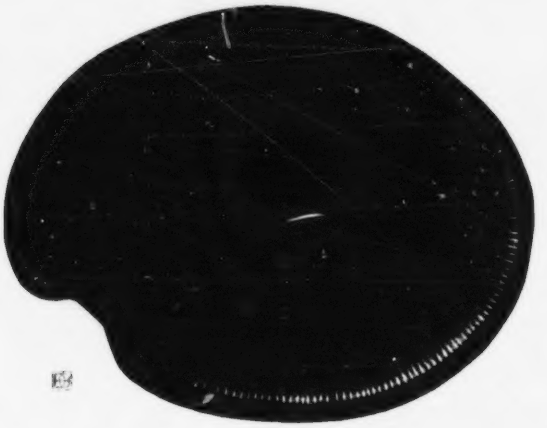

FIGURE 61.—*Asteropella pax*, new species, lateral view of adult male, USNM 159087, length 1.48 mm.

DISTRIBUTION.—Continental shelf off west Florida and south Texas; depth 15–26 m.

DIAGNOSIS.—Each valve with broad, continuous flange lying just within valve margin; posterodorsal margin of flange evenly rounded; edge of valve without broad flange; horizontal midrib extremely short. Length of male holotype 1.48 mm.

COMPARISONS.—Carapace differs from that of *Asteropella maclaughlinae* in posterodorsal corner on inner concentric flange being evenly rounded and in having much shorter midrib. Midrib shorter than that of *Asteropella* species A (Kornicker, 1975:559).

REMARKS.—The short horizontal midrib easily breaks off and is missing from most specimens encountered herein, but on valves of those specimens, the place where the rib had been located is marked by numerous closely spaced pores. USNM 159088 with female choniostomatid copepod within marsupium.

Asteropterygion Kornicker, 1981

TYPE-SPECIES.—*Asteropterygion thomassini*, Kornicker, 1981.

DISTRIBUTION.—Worldwide between about 34°N and 41°S at depths of 0–100 m.

COMPOSITION.—This genus is represented in the study area by only 1 species. *A. oculitristis* (Darby, 1965).

Asteropterygion oculitristis (Darby, 1965)

FIGURE 62

Asteropteron oculitristis Darby, 1965:29, pl. 15: figs 3–7, pl. 16: figs. 1–8.—Kornicker, 1977b:791, 796.

Asteropterygion oculitristis.—Kornicker, 1981a:290, figs. 9*h*, 135–141, pls. 121–137.

HOLOTYPE.—UMMP 48793, juvenile male, length 1.74 mm.

TYPE-LOCALITY.—Off Sapelo Island, Georgia, depth 59 ft (18.3 m).

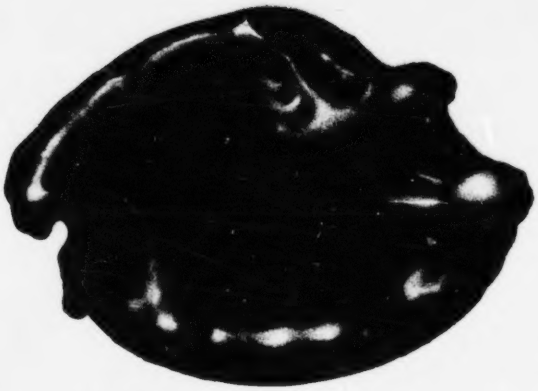

FIGURE 62.—*Asteropterygion oculitristis* (Darby), lateral view of ovigerous female, USNM 150281, length 1.70 mm. (Figure from Kornicker, 1981a, fig. 140.)

MATERIAL.—See "Station Data with Specimens Examined."

DISTRIBUTION.—Atlantic: South Carolina to Florida. Gulf of Mexico: Florida, Louisiana, Texas. Known depth range 1–28 m.

DIAGNOSIS.—Carapace rugose, with 3 posterior processes; rostrum overhanging fairly deep incisur (Figure 62).

Furca: Adult furca with 3 long stout claws followed by 5 or 6 short secondary claws.

Remarks Concerning Mandibular Basale

Skogsberg (1920:480, fig. 7) illustrated a mandible of *Asterope spinifera* (Skogsberg, 1920:476) showing internal muscles. The illustration has a U-shaped process near the middle of the ventral margin of the basale. A muscle extends from the proximal side of the process back into the coxale, where it terminates near the ventral margin. Poulsen (1965:164) in a diagnosis for the family Asteropidae [= Cylindroleberididae] made the following observation concerning the mandibular basale.

> On the ventral margin near the basis of the endite is in many species a groove with glandular openings; this groove is considered as the border between the endite and basale proper; in other species there is at this place only a slight indenture of the margin, in some species also the indenture is lacking and the actual border between basale and endite cannot be defined.

The following species were described by Poulsen (1965) as having on the ventral margin of the mandibular basale a hollow bearing glandular openings: *Archasterope dentata* Poulsen, 1965:343, *Parasterope skogsbergi* Poulson, 1965:381, *P. jenseni* Poulsen, 1965:389, *Synasterope implumis* Poulsen, 1965:424, *S. serrata* Poulsen, 1965:429, and *Cylindroleberis minuta* Poulsen, 1965:438. The ventral margin of the basale of *Parasterope nana* Poulsen, 1965 was described as having a "glandular furrow" (Poulsen, 1965:399). The presence of a hollow or furrow was indicated in illustrations by Poulsen (1965) of mandibles of additional species but was not mentioned in the text.

I have not examined the mandibles of specimens that Poulsen (1965) described as bearing hollows with glandular openings on the ventral margin of the basale, but after failing to find glandular openings in the hollows of specimens that I did examine, and after determining that the hollow is a topographic depression resulting from the shape of a U-shaped sclerotized boss serving as the anchor for a muscle (see illustration of Skogsberg, 1920:480, fig. 7), I have tentatively concluded that the hollow does not have a glandular function. Although the muscle that extends from near the middle of the ventral margin of the basale to the coxale is present in all members of the Cylindroleberididae that I examined, the boss is not developed equally in all of the species. The U-shaped depression in the mandibular basale of *Empoulsenia pentathrix* Kornicker, 1975:502, and *Bathyleberis monothrix* Kornicker, 1975:545, has been illustrated in SEM micrographs (Kornicker, 1975, figs. 312*a*, 313*a,b,d*, 338*f*).

As quoted above, Poulsen (1965:164) considered the hollow to be the border between the basale endite and basale proper. In practice, however, the hollow was not always used by Poulsen to demarcate the basale endite; for example, in describing the mandible of *Parasterope jenseni*, Poulsen (1965:389) stated: "On the ventral margin of the basale is one triaenid bristle and distally of it a hollow for gland openings." If the hollow separates the endite and basale proper, the bristle would have been described as being on the endite. The end of the muscle, which is marked in some species by a sclerotized boss under the hollow, attaches near the ventral margin of the basale proper rather than on the endite, but the position of the point of attachment varies. In some species the muscle is attached near the endite and in others it is attached near the middle of the basale; therefore, the position of the boss or hollow is of limited use in locating the border between the endite and basale proper.

Because the place of attachment of the muscle and also of the boss to which it is attached varies among species, its position may be useful in identifying species. The degree of development of the boss to which the muscle is attached may also be useful in identification.

Zoogeography

It is convenient to relate the distribution of Myodocopa in the study area to biogeographical provinces previously defined by the distribution of other taxa. The history of province delimitation along the Atlantic coast of North America has been outlined by Hazel (1970:E5). The limits of provinces given by Hazel (1970, fig. 4) have been accepted herein for the Arctic, Labrador, Nova Scotian,and Virginian Provinces. There is much disagreement among biogeographers concerning how a province should be defined (Yancey, Culver, Buzas, 1982). In the present paper "province" (Figure 63) is used in the traditional sense of being a geographical area encompassing a faunal assemblage that may occupy the same or dissimilar environments. Biofacies is used to define assemblages within a province. Two biofacies are recognized in the study area: (1) lagoonal and estuarine biofacies and (2) shelf biofacies. The Nova Scotian, Virginia, Carolinian, and Gulf of Mexico Provinces have both biofacies, whereas the Arctic, Labrador, and Caribbean Provinces do not have a recognizeable lagoonal and estuarine biofacies. In the discussion of provinces below, the shelf biofacies is not separated as an entity because it supports essentially the same assemblage as the province of which it is a part.

Lagoons, estuaries, and the shores of shallow bays support a fauna characterized by either *Eusarsiella zostericola* or *Parasterope pollex*, or both species. Along the Atlantic coast, the northernmost known locality for this biofacies is Halifax, Nova Scotia, and the southernmost is the upper end of Lake Worth, near Palm Beach, Florida. In the Gulf of Mexico, the easternmost known locality is near Cape Romano, Florida, and its westernmost known locality is Port Isabel, Texas. The following species are considered to comprise this biofacies; ***Parasterope pollex, Eusarsiella zostericola, E. ozotothrix, E. texana, E. spinosa, E. cresseyi, E. disparalis***. Other species sometimes occurring in this biofacies are ***Harbansus paucichelatus*** and ***Eusarsiella childi***, as well as other shallow shelf species that enter when the environment approaches normal marine conditions. Most of the species are also collected on the shallow inner shelf. This biofacies may be similar, in part, to the Coastal Province of Buzas and Culver (1980), Culver and Buzas (1982), and differs from the Transhatteran Province of Watling (1979:277) in being based, in part, on taxa occurring only south of Cape Hatteras, and in not including shallow shelf species that do not also occur in lagoons, estuaries, and shallow bays. This biofacies also differs from the Transhatteran Province in being present in both the Atlantic Ocean and the Gulf of Mexico. Both the Transhatteran Province and the lagoonal and estuarine biofacies are based on a similar concept and observation, i.e., that the fauna is limited to very shallow water, and seems to have a wider range than fauna on the outer shelf. In a study of podocopid ostracodes, Garbett and Maddocks (1979) found appreciable commonality (15 of 39 species) in bays, estuaries, and lagoons of the northern Gulf of Mexico and Atlantic coast, which supports the concept of a single lagoonal and estuarine biofacies for both areas.

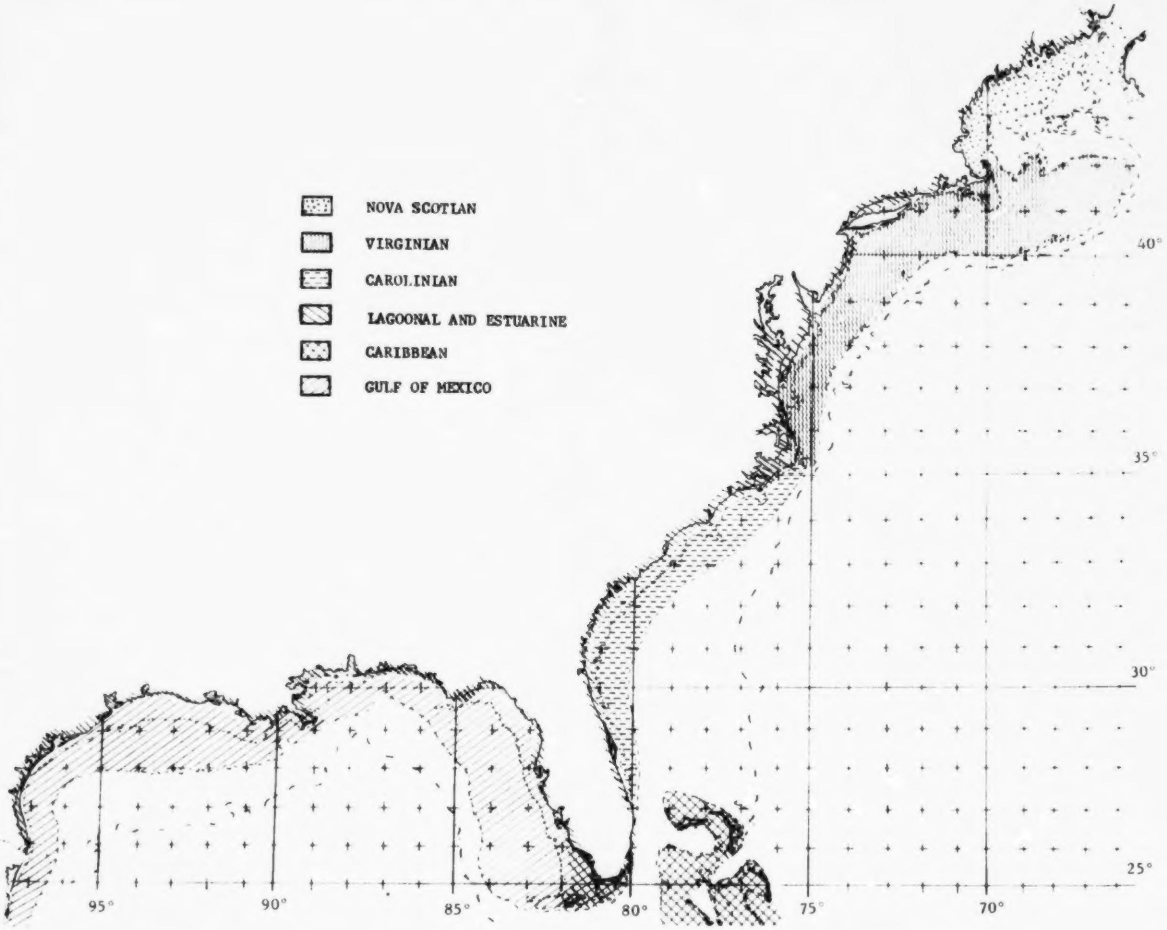

FIGURE 63.—Distribution of Provinces in study area. (Arctic, Labrador, and southern parts of Caribbean Province are outside map limits.)

ARCTIC AND LABRADOR PROVINCES.—The boundary between these provinces, according to Hazel (1970:E7), is in the vicinity of Disk Bugt (70° N), western Greenland, and off southeastern Baffin Island (about 66° N); the southern boundary of the Labrador Province is off southern Newfoundland (Hazel, 1970:E9). Only a single species, *Philomedes brenda,* has been reported at shelf depths in the Arctic Province (Kornicker, 1982; Table 3). *Philomedes brenda* reaches its southern limit off Nova Scotia, and is amphiatlantic in distribution. The distribution of this species fits within the Arctic-Boreal faunal group of Franz and Merrill (1980a,b). Only 2 species are known from the Labrador Province, *Philomedes brenda* and *P. albatross* (Kornicker, 1982). The latter species, which also has its lower limit off Nova Scotia, fits within the Boreal faunal group of Franz and Merrill (1980a,b) although its range is more limited than that of most species they referred to that group. Both provinces are characterized by having few myodocopid species. Members of *Philomedes* are detritus feeders and perhaps this is an advantage in Arctic waters;

TABLE 3.—Distribution and known depth range (m) of Myodocopina on continental shelves of northwestern Atlantic Ocean and Gulf of Mexico subdivided into provinces and lagoonal and estuarine biofacies (dash = not collected; ? = collected but depth uknown; NS = Nova Scotian Province; standard abbreviations used for states).

Species						Caribbean					Gulf of Mexico		Lagoonal and estuarine	
	Arctic	*Labrador*	*Nova Scotian*	*Virginian*	*Carolinian*	*Continental Caribbean*	*South Florida*	*Bahamas*	*Antilles*	*Bermuda*	*NE quadrant*	*NW quadrant*	*Atlantic*	*Gulf of Mexico*
Paracypridina floridensis	–	–	–	–	–	–	–	–	–	–	50–91	–	–	–
Pterocypridina sex	–	–	–	–	5.5–40	–	–	–	–	–	17–23	–	–	–
Skogsbergia lerneri	–	–	–	–	–	2–3	1–20	1–4	2–38	–	88–91	49–125	–	–
Vargula magna	–	–	–	–	160–202	–	–	–	–	–	–	106	–	–
V. bullae	–	–	–	–	–	0–45	–	–	–	–	–	–	–	–
V. parasitica	–	–	–	–	–	–	–	–	1?	–	–	–	–	–
V. harveyi	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Philomedes brenda	37–68	265	plankton 408–448	–	–	–	–	–	–	–	–	–	–	–
P. albatross	–	–	18–95	123–448	–	–	–	–	–	–	–	–	–	–
P. duplex	–	–	–	–	–	–	–	–	–	–	–	49–134	–	–
P. keslingi	–	–	–	–	123	–	–	–	–	–	–	–	–	–
P. hirutai	–	–	–	–	218	–	–	–	–	–	–	–	–	–
Pseudophilomedes ferulanus	–	–	–	85	22–43	–	–	6	–	–	23–190	82–106	–	–
P. ambon	–	–	–	–	–	–	–	–	–	–	22–98	51–105	–	–
P. polyancistrus	–	–	–	–	147	–	–	–	–	–	25	49–110	–	–
P. zeta	–	–	–	–	14–33	–	–	–	–	–	–	17–40	–	–
P. species A	–	–	–	–	–	–	–	–	–	cave[a]	–	–	–	–
Harbansus paucichelatus	–	–	–	–	0–65	2–24	1	0–58	–	–	1–190	15–134	–	–
H. bowenae	–		42	183–196	36	–	–	–	–	–	–	–	–	–
H. dayi	–	–	42	136–196	160–198	–	–	–	–	–	–	–	–	–
Angulorostrum costatum	–	–	–	–	210–218	–	–	–	–	–	–	–	–	–

Euphilomedes "sordida"	–	–	–	–	–	–	–	–	?	–	–	–	–	–
Zeugophilomedes multichelatus	–	–	–	–	–	–	–	plankton	–	–	–	plankton	–	–
Alternochelata polychelata	–	–	–	–	–	–	–	3 1–5	–	–	–	–	–	–
A. sikorai	–	–	–	–	–	–	–	–	–	–	–	61–138	–	–
Rutiderma dinochelatum	–	–	–	–	–	–	–	–	1–20	–	–	–	–	–
R. mortenseni	–	–	–	–	–	–	–	–	?	–	–	–	–	–
R. mollitum	–	–	–	–	11–101	–	–	–	–	–	5–190	–	–	–
R. darbyi	–	–	–	–	1–101	–	1	1–4	–	–	5–168	–	–	–
R. licinum	–	–	–	–	36	–	–	–	–	–	17–68	49–65	–	–
R. gyre	–	–	–	–	6–80	–	–	–	–	–	23–148	49–82	–	–
R. cohenae	–	–	–	–	–	–	1	4	–	–	–	–	–	–
R. arcuatile	–	–	–	–	–	–	–	–	1–9	–	–	–	–	–
R. sterreri	–	–	–	–	–	–	–	–	–	0–11	–	–	–	–
R. kalkei	–	–	–	–	–	–	–	–	–	–	–	91	–	–
R. species B	–	–	–	–	–	?	–	–	–	–	–	15	–	–
Bathyleberis toxotes	–	–	–	–	–	–	–	–	–	–	9–13	–	–	–
Prionotoleberis salomani	–	–	–	–	–	–	–	–	–	–	–	50–58	–	–
Heptonema serratum	–	–	–	–	–	–	–	–	25–30	–	–	–	–	–
H. latum	–	–	289–292	110–196	210	–	–	–	–	–	–	–	–	–
Bruniella hazeli	–	–	–	2	–	–	–	–	–	–	–	–	–	–
B. species A	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Synasterope serrata	–	–	–	–	–	–	–	–	50	–	–	–	–	–
S. longiseta	–	–	–	–	–	–	–	–	?	–	–	–	–	–
S. implumis	–	–	–	–	–	–	–	–	shallow	–	–	–	–	–
S. cushmani	–	–	11–36	–	–	–	–	–	–	–	–	–	–	–
S. species 1	–	–	–	110–196	–	–	–	–	–	–	–	–	–	–
S. setisparsa	–	–	–	–	–	–	–	1–5	–	–	–	–	–	–
S. psitticina	–	–	–	–	?	–	–	–	–	–	–	–	–	–
S. williamsae	–	–	–	–	–	–	–	–	–	–	–	55	–	–
Diasterope canina	–	–	–	–	–	–	–	–	7	–	–	–	–	–
D. tenuiseta	–	–	–	–	–	–	–	–	30	–	–	–	–	–
Parasterope muelleri	–	–	–	–	2–6.7	–	1–5	4	2–30	1	–	–	–	–

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TABLE 3.—Continued.

Species						Caribbean					Gulf of Mexico		Lagoonal and estaurine	
	Arctic	*Labrador*	*Nova Scotian*	*Virginian*	*Carolinian*	*Continental Caribbean*	*South Florida*	*Bahamas*	*Antilles*	*Bermuda*	*NE quadrant*	*NW quadrant*	*Atlantic*	*Gulf of Mexico*
P. zeta	–	–	–	–	–	–	–	–	–	–	–	58	–	–
P. hulingsi	–	–	–	–	31–32	–	–	–	–	–	–	–	–	–
P. extrachelata	–	–	–	–	–	–	–	1	–	–	–	–	–	–
P. pollex	–	–	shallow	1–34	1–8	–	–	–	–	–	1–13	–	NS,MA,NY, FL,DE,VA,	FL
Postasterope corrugata	–	–	–	–	–	–	–	–	10–20	–	–	–	–	–
P. abaco	–	–	–	–	–	–	–	–	–	–	–	–	–	–
P. messingi	–	–	–	–	–	–	2–4	?	–	–	–	–	–	–
Amboleberis americana	–	–	–	–	16–41	5	1–20	3–10	3–10	–	2–29	54	–	–
Actinoseta chelisparsa	–	–	–	–	2–28	1–34	–	1–15	2–10	–	23	15	–	–
A. hummelincki	–	–	–	–	1–2	1–6	–	–	–	–	–	–	–	–
A. jonesi	–	–	–	–	–	2	–	–	–	–	–	–	–	–
Asteropella monambon	–	–	–	–	–	2–24	–	3–20	1–4	–	–	–	–	–
A. mortenseni	–	–	–	–	–	–	–	–	7–40	–	–	–	–	–
A. punctata	–	–	–	–	–	–	–	–	6–30	–	22.5	–	–	–
A. maclaughlinae	–	–	–	–	–	1	1	–	–	–	1–23	2–18	–	–
A. kalkei	–	–	–	–	–	–	–	–	–	–	–	5–8	–	–
A. pax	–	–	–	–	–	–	–	–	–	–	26	15–18	–	–
A. agassizi	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Asteropterygion oculitristis	–	–	–	–	1–28	–	–	–	–	–	1–23	2–15	–	–
Dantya magnifica	–	–	–	–	–	9–20	–	–	–	–	–	–	–	–
D. heardi	–	–	–	–	–	–	–	–	–	–	10–148	–	–	–
Eurypylus rousei	–	–	–	–	11–29	–	–	–	–	–	–	–	–	–
Chelicopia arostrata	–	–	–	–	–	–	–	1–3	4	–	–	–	–	–

Parasarsiella globulus	–	–	–	–	–	–	–	–	?	–	–	–	–	–
Eusarsiella punctata	–	–	–	–	–	–	–	1–5	–	–	–	–	–	–
E. truncana	–	–	–	–	–	–	–	1–20	–	–	–	–	–	–
E. "carinata"	–	–	–	–	–	–	–	1–20	–	–	–	–	–	–
E. alata	–	–	–	–	–	–	–	–	5	–	–	–	–	–
E. cornuta	–	–	–	–	–	–	–	–	5	–	–	–	–	–
E. ovalis	–	–	–	–	–	–	–	–	50	–	–	–	–	–
E. dentifera	–	–	–	–	–	–	–	–	34–40	–	–	–	–	–
E. spicata	–	–	–	–	–	–	–	–	50	–	–	–	–	–
E. zostericola	–	–	1–45	1–23.5	shallow 1–2	–	–	–	–	–	1–3	1–3	NS,MA,RI,MD VA,NC,GA	FL,TX
E. capillaris	–	–	–	–	–	–	–	1–20	–	–	23	–	–	–
E. paniculata	–	–	–	–	–	–	–	–	–	–	23–59	–	–	–
E. costata	–	–	–	–	–	–	–	1–5	–	–	–	–	–	–
E. gigacantha	–	–	–	–	25	–	–	1–20	–	–	–	–	–	–
E. spinosa	–	–	–	shallow[b]	1–36	–	–	–	–	–	1–3	2–58	FL	FL,TX
E. greyi	–	–	–	–	25	–	–	–	–	–	26–27	52	–	–
E. texana	–	–	–	shallow	1–39	–	–	–	–	–	1–3	1	MD,VA,FL	FL,TX
E. disparalis	–	–	–	–	1–34	–	–	–	–	–	1–88	–	NC,FL	FL
E. nodimarginis	–	–	–	–	30–114	–	–	–	–	–	–	–	–	–
E. radiicosta	–	–	–	–	15–130	–	–	–	–	–	14–88	15–134	–	–
E. pilipollicis	–	–	–	–	40–114	–	–	–	–	–	91	62–100	–	–
E. ozotothrix	–	–	–	3–24	1–35	–	–	–	–	–	shallow	–	MS,FL	FL
E. dispar	–	–	–	–	–	–	–	–	–	–	–	3–100	–	TX
E. tubipora	–	–	–	–	33–39	–	–	–	–	–	–	–	–	–
E. gettlesoni	–	–	–	–	–	–	2	2–20	–	–	–	50–65	–	–
E. uncus	–	–	–	–	–	–	–	–	–	–	–	–	–	–
E. childi	–	–	–	–	–	–	–	–	–	–	1–13	–	–	FL
E. cresseyi	–	–	–	–	–	–	–	–	–	–	1–3	2	–	FL,TX
E. elofsoni	–	–	–	–	–	–	–	–	–	–	–	53–82	–	–
E. bakeri	–	–	–	–	–	–	–	–	–	–	53–88	52–91	–	–
E. vema	–	–	42	–	–	–	–	–	–	–	–	–	–	–
E. dominicana	–	–	–	–	–	shallow	–	–	–	–	–	–	–	–
E. athrix	–	–	–	–	–	–	–	2	–	–	–	–	–	–
E. culteri	–	–	–	–	–	–	–	–	–	–	56–88	–	–	–
E. venezuelensis	–	–	–	–	–	shallow	–	–	–	–	–	–	–	–
E. species A	–	–	–	–	–	–	–	–	–	cave[a]	–	–	–	–
E. absens	–	–	–	–	–	–	–	–	–	1	–	–	–	–

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[a] undescribed species.

[b] new record.

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detritus feeders were also found to be common in the Antarctic (Kornicker, 1975).

NOVA SCOTIAN PROVINCE (Figure 63).—This province extends south from the Labrador Province and has Cape Cod as its southern boundary. In addition to *P. brenda* and *P. albatross*, this province contains *Harbansus bowenae, H. dayi, Synasterope cushmani, Heptonema latum, Eusarsiella vema*, and 2 species that are also part of the lagoonal and estuarine biofacies, *Parasterope pollex* and *Eusarsiella zostericola* (Table 3). *Synasterope cushmani* and *Eusarsiella vema* have not been collected outside the Nova Scotian Province. *Harbansus bowenae, H. dayi*, and *Heptonema latum* were collected away from the shore, at depths of 36–292 m, and have their southern limits in the Carolinian Province. These three species appear to fit into a Transitional Group recognized by Williams (1984:4) for decapod species ranging from the Canadian maritime provinces for variable distances southward, and which are not species having either a northern or southern affinity.

VIRGINIAN PROVINCE (Figure 63).—This province with its northern limit at Cape Cod (42°N offshore) and its southern limit at Cape Hatteras is not recognized by some investigators who consider the fauna to represent an overlap with northern and southern affinities (Stephenson and Stephenson, 1954; Bousfield, 1960; Bowen et al., 1980:239; Culver and Buzas, 1980:9). Buzas and Culver (1980) concluded on the basis of the distribution of benthic Foraminifera that the Nova Scotian and Virginian Provinces should be grouped together. Other investigators, based on detailed faunal studies in the vicinity of Cape Hatteras and Cape Cod have concluded that a Virginian Province is justified (Hazel, 1970, 1975a,b; Valentine, 1971). Myodocopa in this province include the 3 species of the Transitional group that are present in the Nova Scotian and Carolinian Provinces. 2 endemic species (Bruuniella hazeli, Synasterope species 1), 5 species (*Parasterope pollex, Eusarsiella zostericola, E. texana, E. spinosa, E. ozotothrix*) that are also part of the lagoonal and estuarine biofacies, and 1 shelf species (*Pseudophilomedes ferulanus*) which is also present in more southern provinces (Table 3). The 3 additional species in the lagoonal and estuarine biofacies of this province have southern affinities. Thus of the 9 species in this province that have also been collected in other provinces, 4 have southern affinities and 5 have been collected in both the Nova Scotian and Carolinian Provinces. The myodocopid assemblage of the Virginian Province is characterized by a paucity of shelf species that are present south of Cape Hatteras. Bowen et al. (1979) stressed the complexity of the distributional patterns of the crustacean fauna of the Middle Atlantic Bight at different depths, and concluded that various taxa differ in their affinities, possibly related to dispersal abilities. Faunal resemblance (Simpson Index) of myodocopids in the Virignian Province is 56 when compared to the Nova Scotian Province and 73 when compared to the Carolinian Province (Table 4), reflecting the southern affinity of many species of the Virginian Province.

CAROLINIAN PROVINCE (Figure 63).—The northern boundary of this province is Cape Hatteras. The southern boundary has been set at different latitudes by investigators but generally between Palm Beach and Cape Canaveral, Florida. The southern limit on the basis of Myodocopa coincides with the southern limit of the lagoonal and estuarine biofacies, which is in the vicinity of Lake Worth (about 26°45′N). The boundary also coincides with a faunal break for octocorals according to Bayer (1961:328). Myodocopids in this province are diverse, comprising 36 species (Table 3): 7 endemic species (*Philomedes keslingi, P. hirutai, Angulorostrum costatum, Synasterope psitticina, Eurypylus rousei, Eusarsiella nodimarginis, E. tubipora*); 1 species (*Parasterope hulingsi*) described originally from the continental shelf of southern California (Baker, 1978:145); 3 species of the Transitional Group also present in the Nova Scotian and Virginia Provinces; 6 species of the lagoonal and estuarine biofaces (*Eusarsiella disparalis* plus the same 5 species of this biofacies present in the Virginian Province), and 19 species also in the Caribbean

TABLE 4.—Simpson indices based on species in common between provinces.

	Arctic	Labrador	Nova Scotian	Virginian	Carolinian	Caribbean	Continental Caribbean	South Florida	Bahamas	Antilles	Gulf of Mexico	Northeast	Northwest
Arctic	–	100	100	0	0	0	0	0	0	0	0	0	0
Labrador	100	–	100	0	0	0	0	0	0	0	0	0	0
Nova Scotian	100	100	–	56	44	0	0	0	0	0	33	33	11
Virginian	0	0	56	–	73	9	0	0	9	0	55	55	36
Carolinian	0	0	44	73	–	19	27	44	17	17	58	59	47
Caribbean	0	0	0	9	19	–	–	–	–	–	37	32	32
Continental Caribbean	0	0	0	0	27	–	–	44	40	27	40	33	40
South Florida	0	0	0	0	44	–	44	–	89	33	56	56	44
Bahamas	0	0	0	9	17	–	40	89	–	25	26	26	22
Antilles	0	0	0	0	17	–	27	33	25	–	17	17	13
Gulf of Mexico	0	0	33	55	58	37	40	56	26	17	–	–	–
Northeast	0	0	33	55	59	32	33	56	26	17	–	–	59
Northwest	0	0	11	36	47	32	40	44	22	13	–	59	–

or Gulf of Mexico Provinces (2 of these also in the eastern Pacific). Herbst et al. (1979), on the basis of the northern range limits of the Carolinian decapod fauna represented by 291 species, concluded that the Cape Lookout-Cape Hatteras area is a barrier to 60.8% of the fauna. Of the myodocopids, 75% of species in the Carolinian Province are absent from the Virginian Province.

The area just north of Cape Hatteras has not been densely sampled for myodocopids; additional sampling may prove Cape Hatteras not to be so strong a barrier as presently perceived. Of possible significance is the absence of members of the Rutidermatidae, Asteropteroninae, and Cyclasteropinae north of Cape Hatteras. These taxa are present in the Caribbean and Gulf of Mexico Provinces, but have not been reported either in the Arctic (Kornicker, 1982) or Antarctic (Kornicker, 1975), suggesting that their distribution may be partly controlled by temperature.

NORTHERN GULF OF MEXICO PROVINCE (Figure 63).—None of the collections considered herein are from the southern Gulf of Mexico. The continental shelf of the northern Gulf has been generally interpreted as an extension of the Carolinian Province (Briggs, 1974:214). Mainly because of a large number of endemic myodocopid species (35%, 17 of 48 species) in the northern Gulf, I have interpreted the northern Gulf to be a separate province. The southern boundary of the Northern Gulf Province excludes the Florida Keys and has its eastern continental boundary at about Cape Romano, Florida, and its western boundary, provisionally, in the vicinity of Tampico, Mexico. Consideration of the Gulf as a separate province is not without precedent (Puri, 1966:477); also, Bold (1974:215) recognized a Gulfian Province for Neogene podocopid and platycopid ostracodes; and Antoine (1972, fig. 1), based on geological characteristics, delimited 2 provinces in the northeastern Gulf and 1 in the northwestern Gulf; and Culver and Buzas (1982, 1983) recognized three provinces in the Gulf based on depth zonation of Foraminifera on the shelf, and a fourth province on the continental slope and abyssal plain. Nevertheless, the Gulf myodocopid assemblage is closely related to the Carolinian assemblage: 46% (22 of 48 species) of Gulf myodocopids live also in the Carolinian Province, and the faunal relationship (Simpson Index) between the two provinces is high (58) (Table 4).

In addition to the 17 endemic species, this province supports 6 species of the lagoonal and estuarine biofacies that are also present in the Carolinian Province, and 25 species that are also present in either the Caribbean or Carolinian Provinces, or in both provinces (Table 3). One of the species (***Pseudophilomedes ferulanus***) is present in the Virginian Province as well as in the Caribbean and Carolinian provinces. None of the species of the transitional group are in the Gulf of Mexico.

Morkhoven (1972:241) observed from a cursory examination of mostly podocopid ostracodes that assemblages from the northwestern Gulf differed markedly from assemblages from the northeastern Gulf. Considerable differences also are apparent in comparisons of myodocopids from each quadrant; 41% of the species in the NE quadrant were not collected in the NW quadrant. Myodocopa in the northeast quadrant comprise 14 genera with 34 species (6 endemic) (Table 3). Faunal resemblence of species (Simpson Index) is 59 when compared with the northwest quadrant, and also when compared with the Carolinian Province. The northwest quadrant includes 16 genera with 34 species (10 endemic) (Table 3). Faunal resemblance (Simpson Index) is 47 when compared with the Carolinian Province (Table 4). Species living in both the NE and NW quadrants of the Gulf are more likely to also live in the Carolinian Province than species living in only 1 quadrant, and species living only in the NE quadrant are much more likely to also live in the Carolinian Province than species living in only the NW quadrant (43% compared to 14%). The high percentage of species in the Carolinian Province that live in both the NE and NW quadrants of the Gulf (70%) suggests that species able to traverse the Mississippian fan are also able to traverse the southern tip of Florida, or were able to in the past when the sea level differed.

CARIBBEAN PROVINCE (Figure 63).—This province includes the southern tip of Florida and the Florida Keys, the continental coast of the Caribbean Sea, Bermuda, and the West Indies, which includes the Bahama Islands and the Antilles. Briggs (1974:72) recognized a West Indian Province, separate from the Caribbean Province, which included the Bahamas, Antilles, and Bermuda as an outpost. This is not justified on the basis of the Myodocopa because the faunal relationship between the Bahamas and the Southern tip of Florida is 89 (Simpson Index), and only 25 when comparing the Bahamas and Antilles (mostly Lesser Antilles) (Table 4). A close relationship between podocopids of the shallow carbonate platforms of Yucatan, Florida, and the Bahamas was noted by Bold (1977). The Myodocopa of the Antilles and of the continental Caribbean are not well known, and faunal relationships are not yet clear. The zoogeography of the Caribbean fauna is especially difficult to interpret because of fragmentation of the region as a result of plate movements (Hedges, 1982).

Only 4 Myodocopa have been described from Bermuda (Kornicker, 1981b); 2 additional species are reported herein (Table 3). The Myodocopa in Bermuda are not as closely related to West Indian fauna as are other crustacean groups. Southern affinity of the Bermudan fauna is suggested by the presence of ***Rutiderma sterreri***, which is closely related to, and possibly conspecific with ***R. dinochelatum***, a Bahaman species.

Diversity

Kornicker (1977, fig. 5) concluded that the number of species living in coastal embayments of North America increased from north to south along the Atlantic coast, and from east to west along the northern coast of the Gulf of Mexico. The number of species on the continental shelves also increase from north to south along the Atlantic coast, but are similar in the eastern and western quadrants of the northern Gulf of Mexico (Table 5). Similar trends occur also in the numbers of genera and endemic species (Table 5).

Morkhoven (1972:245) compared the number of species of podocopid and platycopid ostracodes at various depths in the northwest Gulf of Mexico. The number of species of Myodocopina in three of his zones (1, inner neritic (littoral) zone (0–20 m); 2, middle neritic zone (20–100 m); and 3, outer neritic zone (100–200 m)) are compared in Table 6.

TABLE 5.—Comparison of the numbers of genera, species, and endemic species occupying provinces and subdivisions.

Province	Number of genera	Number of species	Endemic species
Arctic	1	1	0
Labrador	1	2	0
Nova Scotia	5	9	2
Virginian	7	17	2
Carolinian	15	36	8
Gulf of Mexico	20	48	19
NE quadrant	14	34	6
NW quadrant	16	34	10
Caribbean			
Continental	9	15	7
South Florida	8	9	0
Bahamas	15	27	12
Antilles	14	24	16
Bermuda	4	6	5

The number of species of Myodocopina on the shelf in the northwest quadrant of the Gulf is highest in the middle neritic zone, which is the zone in which Morkhoven found the highest number of species of podocopid and platycopid ostracodes. The number of species of Myodocopina is also highest in the middle neritic zone on the shelf of the northeast quadrant of the Gulf (Table 6).

Hazel (1975b:737) used the Shannon-Wiener information function as a measure of species diversity of podocopid and platycopid ostracodes in 38 samples collected between depths of 15–86 m in the vicinity of Cape Hatteras, North Carolina. Eleven of the samples were collected in the inner neritic zone (0–20 m), and 27 from the middle neritic zone (20–100 m). Hazel (1975b:741) concluded that diversity was generally higher in the deeper stations. The same general relationship holds for diversity (number of species) of myodocopids in the Carolinan Province when comparing the inner and middle neritic zones, but like diversity relationships in the Gulf of Mexico, myodocopid diversity in the Carolinian Province decreased in the outer neritic zone. That zone was not included in the study by Hazel (1975b).

TABLE 6.—Numbers of species within depth zones in the Carolinian and Gulf of Mexico Provinces (numbers in parentheses = number of species found in each province or quadrant).

Province	Inner neritic (littoral) zone 0–20 m	Middle neritic zone 20–100 m	Outer neritic zone 100–200 m
Carolinian (36)	17	23	12
Gulf of Mexico (48)	27	36	12
NE quadrant (34)	18	26	6
NW quadrant (34)	16	21	10

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